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Prevention of Occupational Eye Accidents*

Claude S. Perry, M.D., F.A.C.S.

DISCUSSION of the measures which will prevent eye accidents and their more serious complications

IT has been said, "Rehabilitation begins with prevention." This short statement finds its maximum application in our field of preventing accidents to the eye.

According to the division of safety and hygiene, 29,536 claims for eye injuries were filed with the Industrial Commission of Ohio during the year 1935. Of these, 27,980 were injuries to one eye and 1556 to both eyes. A total of 133 eyes were lost during the year. These injuries resulted in the loss of 269,098 working days.

As we consider the above statistics our problem seems to divide itself into four phases: (1) the prevention of eye accidents; (2) the care of the injured; (3) the cost to the employer and to the employee—a cost which can not be reckoned in dollars alone; and (4) the legal aspect.

Study of the first phase, "prevention of eye accidents," presents several points for thought.

It is ridiculous for anyone to believe that even the most calloused employer would knowingly and willingly permit one in his employ to be blinded through accidental means if he were certain he could prevent it. It is incredible that his humanitarianism would let him lose a faithful workman, even if the economic loss did not bother him. From the workman's side it is just as ridiculous to believe that anyone would be willing to go through the pain of losing an eye just to see what it would be like to wear a glass eye. Then just where is the trouble? Is it habit? Is it carelessness,

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, Columbus, Ohio, December 4, 1936.

indifference, false pride or just plain ignorance on the part of the employer or employee?

To-day we are primarily concerned with the measures which will prevent eye accidents and their more serious complications.

Physical Examination Upon Employment

Before a man is employed to do a given kind of work, would it not be better to give him the benefit of a physical examination to determine his fitness for the job? From our point of view there are several reasons for this action. The first and most obvious is to find out whether the applicant has visual acuity sufficient for the job. Not less significant are the questions: Does he have some pathologic eye condition which may be contagious or may become progressive or be aggravated by some minor injury? Does he have some physical handicap not outwardly noticeable but which may be dangerous to himself or his fellow workmen?

The examination of the eyes should be done accurately and carefully. The condition of the cornea, the color and reaction of the iris and the workman's apparent age are important and should be noted in the record kept of the examination. This reminds me of a case of a man employed by one of the largest factories in this country. Following an alleged minor injury to his eyes, this man claimed compensation for loss of sight. The examination made at the time he was hired, two weeks previous, showed him to be of an apparent age of 20, with blue eyes and a visual acuity of 20/20 in each eye. The man applying for the compensation was over 50, with brown eyes and senile nuclear cataracts. There was no evidence of injury. Further investigation revealed that he had purchased his job from the 20-year-old man who was easily able to pass the examination. Congenital colobomas of the iris and other ocular alterations are sometimes used by malingerers with the hope of establishing a claim for damages. The written record taken at the time of the examination will easily disprove any such false claims.

The need for such a physical examination to demonstrate fitness prior to placing a man at a given job may be much more evident than the need for repeated examinations of that same employee at stated periodic intervals. To illustrate, let me cite a typical case of claim for loss of sight, the case of a man who, when employed,

had tabes, a syphilitic infection of the nervous system. Let us assume that no physical examination had been made at the time he took the job and he was not aware of his illness. Some time later he is found unconscious. He has sustained a head injury. He recovers, time passes and he discovers his vision is reduced to less than 20/200, with the visual fields constricted. Investigation could not prove that the accident had not accentuated an ailment already present. Instead of tabes, this might have been an intraocular or retinal hemorrhage associated with hypertension or arteriosclerosis; diabetes; retinitis pigmentosa, chronic glaucoma or some similar condition, as well as the type of case described. Had the company employing the man required a periodic eye examination, the malady would have been discovered in time to avoid the necessity of the payment of a big claim and the man might have learned of his trouble in time to have received adequate treatment.

Eyestrain; Improper Lighting

We have been considering certain phases in the physical examination of the workman. Now let us turn to two factors which affect the endurance of the eyes, namely, the muscles of the eye and improper lighting. The former can be evaluated by the physician, the latter by the lighting engineer.

Fatigue of the eyes causes inefficiency among workers. It is a cause of headache, loss of time from work, spoiling of materials and accidents. Eye fatigue may indicate the need for properly fitted glasses or an unstable ocular muscle balance. You are familiar with the phorias and muscle duction tests, and the great importance the army places on the perfect muscle balance of its airplane pilots. These aviators must have perfect depth perception. If, for example, they should develop a tendency for one eye to deviate outward, an exophoria, and, under fatigue, stress or some illness, this tendency should become manifest, they would no longer have depth perception. Such a condition, even if only of momentary duration, might end disastrously. The same holds true for the auto driver and applies to any occupation where depth perception or stereopsis is essential.

Closely allied to eyestrain is the question of proper lighting.

The light may be so dim that objects can be seen only with difficulty. An artificial light may be so placed that shadows are formed which create an occupational hazard. Often, having the electric light bulbs cleaned at regular intervals is sufficient to eliminate some of the difficulty. Just as the light may be too dim, it also may be too bright. It may be so bright or dazzling as to cause undue retinal fatigue. Our modern lighting engineers have done much to make factory owners light- and glare-conscious. By means of photometric instruments the intensity of light required by an individual for a certain type of work can be accurately determined. Glare or light when reflected from below into the eyes, as from a polished surface, is likewise fatiguing to the retina. The condition of glare is often easily eliminated by some simple measure such as putting a green blotter on a highly polished desk or painting machinery or offending polished surfaces with a flat paint. Reflections from ice, water or tanks of fluid present their special problems.

Safeguarding the Workman's Environment

Having considered the physical fitness of the workman, I wish to say just a word about his working environment. The safety of this environment is reflected by the number and types of cases coming for first aid. If you are the nurse in charge of the factory emergency room, you should not only concern yourself in seeing that your patient receives the best emergency treatment possible but you should note the kinds of injuries and the departments of the factory from which these cases are coming. If the number seems unreasonable, have it investigated by your safety man; then check to see that the cause has been eliminated.

Treatment of Foreign Bodies in the Eye

The most common form of eye injury is the small foreign body, speck of dirt, sand, emery, etc., that gets under the eyelid or is imbedded in the cornea. These incidents seem so trivial to the workman that they are frequently neglected until the following day, when after an uncomfortable night he reports for first aid. As you endeavor to educate the workmen not to neglect injuries, you must warn them of another danger equally as great. In nearly all factories there is usually someone, a presbyopic timekeeper or a

machinist, with dirty hands, who is titled "Doc" and who prides himself on his ability to remove the offending foreign body from his fellow workman's eye. He performs this operation with his none too sterile jackknife, handkerchief, a pointed match stick, nail or like instrument, not bothering with antiseptics or anesthetics. Just as we know of the danger engendered by such methods, so too are the Ohio Industrial Commission and self-insured companies becoming aware of the fact that there is a lessening of expense and better treatment afforded by sending their eye accidents to a physician skilled in the diseases of the eye. It is true that not all localities have an ophthalmologist and must rely on a general practitioner, but to quote Dr. Snyder of Toledo, "A great many of these cases which would be returned to work in a few days without loss of vision if properly treated are so unintelligently handled that there is a small loss of vision up to total economic loss, for what should be only a few days' disability." Any corneal abrasion may become infected and the resultant ulcer heal with scar formation, or, if the abrasion is infected with some virulent germ as the streptococcus viridans, the eye may be lost. It is often the first treatment received after getting a foreign body in the eye that decides the ultimate disability or outcome.

The workers who fabricate metals show the highest percentage of industrial accidents. In the foundries and steel mills we encounter burns of the lids and eyes from sparks and molten metal. When making castings there is danger of hot sand getting into the eyes. After the casting has cooled, the rough spots or scale must be either chipped or ground off. There is a real danger in using cheap hammers, sledges, punches or chisels because when the ends of these tools become frayed or mushroomed, pieces may be broken off and fly into the eye. Such particles are usually not hot enough to be rendered sterile and form a means of carrying bacteria into the eye.

Need for Goggles

Most of these accidents can be prevented by a proper type of goggles. Such goggles should conform to the specifications of the National Safety Code. In some occupations a simple goggle made of shatterproof glass, not isinglass, will suffice. But for a man working with a lacquer spray or in some similar occupation, without

hood, goggles should be provided with soft rubber edges which will, by fitting closely against the skin about the eyes, avoid the entry of irritants. Goggles form a most important link in our prevention program, but goggles are not the only safeguards to be considered. Metal or plate-glass guards can be mounted in suitable positions on machines. Screens should be placed around welders, users of the acetylene torch and workers in similar occupations. Screens, when placed between crowded machines, prevent flying particles from hitting neighboring workmen, or staggering of the positions of machines may serve a like purpose.

There are numerous and often unseen dangers to be found in certain industries which may act as eye irritants or poisons. To mention a few: the fumes from acids or strong alkalies, abrasive dusts, toluene, benzene, certain alcohols, naphthalene, thallium, lead and zinc fumes, etc.

There is another unseen danger which I observed while working as a machinist in a factory some years ago, a danger best expressed in the phrase, "Familiarity breeds contempt." A man may work at one job so long that through familiarity he becomes negligent and does not wear his goggles. Fortune may favor him for a time, but eventually his name will be listed on the emergency room record. And, by the way, even in your profession, where carelessness is outlawed, we have seen that familiarity breeds contempt; else why was it that two Ohio nurses were reported to the Commission as blind from self-contamination while caring for gonorrheal cases last year?

Serious Complications of Apparently Trivial Accidents

Up to the present we have been considering the prevention of eye accidents. There is another phase to be mentioned, namely, the prevention of serious complications from apparently trivial accidents.

Last year there were 25,798 cuts or abrasions filed as claims with the Ohio Industrial Commission. To avoid unnecessary complications, there are certain general rules for you as first-aid nurses to follow. Remove dust or dirt from the eyes, separate the lids and flush the eye gently with a boric acid or normal salt solution, then instill a few drops of a proper antiseptic. The removal of imbedded

foreign bodies should not be attempted. Acid burns should be treated by flushing with running water and referred at once to a doctor. Alkali burns should be handled in the same way as acid burns. Do not attempt to neutralize, as the reaction produced by the acid and alkali may be worse than the burn. After the removal of an imbedded corneal foreign body there is an abrasion. This should be treated with an antiseptic ointment and an eye pad applied in such a manner that the lids do not move under it. When the cornea no longer takes the fluorescein stain, the eye pad can be discontinued. It is important that all char, especially in emery burns, be thoroughly removed. Lime burns are successfully treated with neutral ammonium tartrate solution.

Conclusions

However, it was not intended to discuss the treatment of eye injuries in this paper, but rather to consider a few points in the needful and interesting subject of preventing needless ocular injuries. What has been said only serves as an introduction which we can now summarize.

1. All workmen should receive a careful eye examination before being assigned to a job. I do not mean a perfunctory examination with a card of letters by an eyeglass vendor but an examination by a qualified physician who has had training to recognize disease in its incipiency.
2. Re-examination should be made at periodic intervals.
3. Keep an accurate record of all examinations and treatments.
4. Continuously promote educational safety programs. It is the apparently trivial accident that may need the tetanus antitoxin.
5. Give proper attention to illumination.
6. Insist through supervision that mechanical safeguards are in proper condition and are continuously and intelligently used. A man acquainted with the hazards and a knowledge of safety engineering should be assigned to every factory.
7. Prepare yourselves to give proper emergency care to all injuries. It is much better to refer what seems to be a minor injury to your ophthalmologist than to have the workman doomed to impaired vision, the loss of an eye or total blindness for the rest of his life.

What Are the Educational Facilities for the Visually Handicapped?*

Winifred Hathaway

A PRESENTATION of bases of selection of children for sight-saving classes, together with a plan for how and where the classes should be taught

EARLY education provided for but one group of children, the normal. Unless a child could conform to standards set down for this group, he was given scant consideration and was expected to get along as best he could. But later it was recognized that, so far as education requiring eye use is concerned, there was a group that could, in no wise, conform—the blind—and educational facilities began to be provided to meet their needs.

There existed, between these two extremes, partially seeing children who were misfits in either group, and, although the need of special educational facilities for them was recognized as early as 1802, it was not until 1908 that any definite step was taken for their welfare, through the establishment of myope schools in England. In the United States, in 1913, two classes were established for the education of children with seriously defective vision. Since that date the number has increased slowly but steadily until, at the present time, there are over 500 sight-saving classes in 168 cities, 24 states, District of Columbia and Territory of Hawaii.

The Purpose of Sight-Saving Classes

The purpose of these classes is to make possible an education for those who, because of their serious eye difficulties, cannot advan-

* Presented at the Institute on Conservation of Vision, Brooklyn, N. Y., April 17, 1936; arranged by the Bureau of Prevention of Blindness of the Division for the Blind, New York State Department of Social Welfare; and sponsored by the Eyesight Conservation Committee of the Brooklyn Health Council; Medical Society, County of Kings and Academy of Medicine; and the Brooklyn Ophthalmological Society.

tageously carry on their work under conditions provided for the normally seeing, yet who have enough sight to use their eyes as the principal avenue of educational approach to the brain. The ultimate object is, of course, the same as in all education, so to help children grow and develop—mentally, physically and morally—that they may realize the fullest possibilities that life has to offer them.

Eligibility of Candidates

It is difficult to draw a distinct line of demarcation separating the various groups. In order, however, to have some criteria for placement, the following general classifications are made: In the first group may be included all those having normal eyesight and those having such slight eye difficulties that, with glasses or treatment, they may work advantageously, to themselves and to others, with the normal group. At the other end of the scale will be found not only those totally blind but those having such exceedingly low vision that they must be considered educationally blind, and who, although able to see to a certain extent, must use their other senses, rather than that of sight, as the chief avenue of educational approach to the brain. In this classification will be found, in general, children having less than 20/200 visual acuity in the better eye after refraction or treatment.

The group between these two extremes will be composed of those having a visual acuity of between 20/70 (in some places, 20/50) and 20/200 in the better eye after refraction; children having progressive eye difficulties that are likely to grow worse unless their sight is carefully safeguarded; children with non-communicable eye diseases, or non-communicable systemic diseases affecting the sight.

These three latter groups have been, in the past, considered the bases for selection of candidates for sight-saving classes, but there are three other groups that may be considered as temporary sight-saving class pupils:

1. Children who have had eye operations, such as enucleation, that make necessary readjustments in eye use as well as psychological readjustment.
2. Children who have been suffering from diseases such as

measles that may affect the sight temporarily, who need special eye care until they are able to assume the full responsibility of the regular grade work.

3. Children with muscle difficulties that may necessitate occlusion of the good eye during school hours or certain orthoptic training exercises, in cases in which there may be psychological reactions.

Estimate of Children Requiring Advantages of Sight-Saving Classes

Fortunately, the number of partially seeing children is small in proportion to the school population. The most conservative estimate is that of one in a thousand of the school population. In places where classes have been established for some time and in which careful surveys have been made to discover such children, the proportion is found to be much nearer one in five hundred of the school population.

From this small number it will readily be seen that every school could not support a sight-saving class; indeed, such a class may serve a district, a community and sometimes even a county. Also, it will be obvious that several grades may often be represented in such a group.

Special Qualifications of Instructor

The selection of a teacher is a most important factor. Since children placed in sight-saving classes are of normal mentality, the first requisite for a teacher of a sight-saving class is that she be able to keep the normal attitude. Hence she should have the basic training of one who is to teach normal children, and should have had three, preferably five, years of successful regular grade teaching. The requirements for such training and experience differ in various parts of the United States, each state having its own criteria for foundational work.

In addition to this basic training, a teacher should have special training along the following lines:

1. Anatomy, physiology, and hygiene of the eye, together with a study of common eye diseases and errors of refraction and their psychological reaction;

2. Organization and maintenance of sight-saving classes;

3. Methods of teaching such classes in order to be able to adapt the teaching of the school curriculum to the special needs of each child in her group.

Such teacher must spend her own sight generously in order to curtail the close eye use of her pupils. Hence it is evident that she should have good eyesight.

George Herbert Palmer, in *The Ideal Teacher*, has laid down specific qualifications, without the possession of which he says it is undesirable for anyone to enter the profession of teaching. The first of these is an aptitude for vicariousness; the ability to put oneself in the place of another and to understand his reactions. This is an essential qualification for a sight-saving class teacher, since, without it, it is practically impossible for her to understand the inhibitions and reactions that may result from any handicap, and, more specifically, from the various types of eye handicap.

As the second, he specifies the necessity of a teacher's possessing a wealth of knowledge. Here again, since sight-saving class pupils are unable, because of eye conditions, to seek out for themselves through wide reading many of the things the normally seeing child is able to find for himself, the sight-saving class teacher must be unusually equipped with a wealth of knowledge upon which her pupils may draw.

The third qualification, he states, is the power to invigorate knowledge with interest. The sight-saving class teacher must be able to devise ways and means of invigorating knowledge with interest independent of much eye use. She must constantly be on the alert for new materials and new methods of presentation in order so to arouse and hold the interest of her pupils that they will be carrying on creative work without drawing unduly upon their sight.

Palmer's last qualification is a willingness to be forgotten. Lack of this qualification in a sight-saving class teacher may lead her to succumb to the temptation of permitting partially seeing children, because of their handicap, to become dependent upon her instead of imbuing them with that spirit of independence and self-confidence that will be of inestimable assistance in helping them so to overcome their handicap that they may compete with the normally seeing.

Physical Set-Up and Materials

So much has been written regarding the physical set-up of the special classroom that is to house partially seeing children and of the educational material for their use that it would be repetitious to list them again.*

Method of Instruction in Relation to General Classes

It is very important, in considering any form of education, to guard against the possibility of developing a new handicap in trying to help the pupil to overcome the one that exists. Since the real purpose of any type of education is to enable people to live advantageously in a social world, any barrier that is set up between the normal and the handicapped will necessarily interfere with the carrying out of this purpose. Hence, the barrier of segregation should be avoided in so far as it is possible to do this to the greatest benefit of all concerned.

Sight-saving classes are, therefore, established, in the majority of cases, in public school systems and are considered a very definite part of such systems. Schools are selected having the same grades as those represented in the sight-saving class. Thus, in a system using the 6:3:3 plan, the sight-saving class having elementary school children should obviously be placed in an elementary school building, the junior high school class in a junior high school building, and special arrangements should be made for partially seeing high school students in a high school building. The reasons for this should be evident: That partially seeing children may have the benefit of living with children of their own age and of joining with them in all those activities that do not require close use of eyes. Obviously, work requiring close use of eyes is undertaken in the sight-saving classroom under the direction of the specially trained teacher.

This plan is designated as a co-ordinating or co-operative plan and is followed by over 90 per cent of the sight-saving classes in the United States. In most of the few centers where the segregated plan is followed, an effort is made for some social contact such as

* Hathaway, Winifred. *Room Design and Equipment Requirements for Sight-Saving Classes*, National Society for the Prevention of Blindness, Inc., 1936, Publication number D86. Single copies will be sent upon request to the National Society.

having assembly groups meet together and, in some instances, taking playground activities in unison.

Broad Scope of Sight-Saving Education

It must be obvious that most of the helps and safeguards given to partially seeing children are equally applicable to all groups. If normally seeing children could be given the benefit of the medical and optical service made available for sight-saving class children; if, likewise, they could be given the benefit of the physical surroundings that have been suggested for the betterment of partially seeing children, with the exception of those that are noticeably in the nature of compensation for serious eye difficulties, it is probable that the ultimate need of sight-saving classes might be eliminated.

The Problem of the Cross-Eyed Child*

Le Grand H. Hardy, M.D.

THE author outlines the five main steps in the treatment of the cross-eyed child, which requires patience, knowledge, tact and sympathy

THE problem of the cross-eyed child is a challenge to you, to society and to the doctors who care for him. It is pitiful that in a city like New York there should be 50,000 children starting on life's journey with such a serious physical, social and psychological handicap. It is estimated that 70 per cent of our body activity is controlled by use of our eyes. It is certain that more than 70 per cent of us look at an individual's eyes when we are trying to determine his character, to interpret his expression or to judge his words. Most of a child's learning comes through his eyes and a large part of the impression he makes upon others depends upon how well he is able to use his eyes to control his motions and expressions. The problem of the cross-eyed child has many aspects. Three important ones might be labelled: (1) cosmetic, (2) psychological and (3) functional.

Cosmetic Aspect of Cross-Eyes

The cosmetic effect of cross-eyes is obvious to anyone. It is an unpleasant disfigurement, an embarrassment both to the victim and to those who associate with him. It has been the subject of scores of heartless and thoughtless jokes. In ancient times it occasioned much cruelty because superstitious people believed it to be the result of inhabitation by an evil spirit, and mercilessly beat the poor patient with the intention of driving the evil spirit out of him. In other times it was attributed to inhabitation by an angel

* Radio address presented over Station WABC, October 8, 1936, under the auspices of the Medical Information Bureau of the New York Academy of Medicine.

or benign spirit, and cross-eyed people were worshipped, since they obviously had the supernatural power of seeing in two directions at once. Persecution or worship, their lot was never a happy one, for they were thrown outside the normal life of the communities in which they lived.

From the viewpoint of the eye physician or surgeon the cosmetic problem of cross-eyes is the easiest to handle, since modern surgery makes it possible to operate on a high percentage of cross-eyed patients with an excellent outlook for cosmetic success. That is, in most cases of squint or crossed eyes an operation will greatly decrease, if not eliminate, the disfigurement. Regarded in this light, surgery is a blessing to the cross-eyed child, since it reduces the conspicuous disfigurement and makes it possible for him to get and hold some positions that would otherwise not be open to him. From this first, or cosmetic viewpoint, the problem of the cross-eyed child consists in reducing or eliminating a physical defect, a blemish or deformity which sets a child apart from his schoolmates and makes him an object of pity or ridicule. At the same time, psychologically the reduction or elimination of the physical defect, the distressingly conspicuous disfigurement, improves the child's mental attitude and relieves him of many serious handicaps. The feeling of being different, defective and conspicuous all too frequently produces shyness, timidity and a sense of inferiority which may seriously affect a child's life. Other children are brutal and many adults are heartlessly thoughtless in calling attention to, or speaking of, a child's squint or other defect in his presence. Part of the modern treatment of squint consists in covering up the good eye in order to make the poor or crossed eye work and develop its powers, and many times I have had reported to me the bad effects of friendly but tactless interest. Let me appeal to you, if you like children, please do not embarrass those unfortunate ones by calling attention to their misfortune—either the squint from which they suffer or the bandage or patch used in treating it.

Psychologic Aspect of Cross-Eyes

From this second, or psychological, viewpoint the problem of the cross-eyed child consists in developing or re-establishing the normal

human relationships which are so important in a child's life. If he is later to develop into a healthy normal adult, it is essential that he not be laughed at, ridiculed and ostracized as a child, and this is almost impossible if he goes through adolescence with a squint or crossed eye. Most squinting children are of the nervous type. Frequently they are sensitive, shy and easily hurt. Often they have other signs of poor co-ordinations such as stuttering, stammering and unusual awkwardness in the use of their hands and feet. Frequently these signs are compensated for by definite mental brilliance—cross-eyed children as a group are not dull or stupid. The eye physician, if he is a good psychologist, makes definite efforts to combat these feelings of inferiority, of shyness, timidity and nervousness, and encourages rhythmic games such as dancing, skating and swimming, both as an aid to acquiring those smooth, rhythmic co-ordinations known in sporting circles as "timing," and to establish better control and poise and discourage a feeling of inferiority.

Functional Aspect of Cross-Eyes

The problem of the cross-eyed child from the functional viewpoint is just now a matter of great and nationwide interest to those dealing professionally with the eyes. From this viewpoint the problem is how to develop or re-establish the normal smooth co-ordinations of the eyes so that they work together as a team. The normal human being is a two-eyed individual, and the 12 or more tiny muscles which are used in working the eyes function smoothly and in an almost perfectly co-ordinated manner. This is not true in squint. Not only does the squinting or crossed eye usually fail to see well but its position in relation to the fellow eye and its movements as a part of the team are seriously disturbed. The problem of treating this is a difficult one and has given rise to a whole new method or technique—a branch of ophthalmology known as orthoptics. Orthoptics, or eye exercises, is a method of developing or restoring the normal functions and teamwork of the eyes. Its value in the treatment of squint is still a matter of violent controversy—some claiming almost universal success, others doubting the possibility of any. The truth, as usual, lies between the two. There is no question that in some cases it has

been made into a racket by those with neither the intellectual ability nor honesty to appreciate its true worth. Properly and conservatively carried out, it is an important and useful part of the treatment of the cross-eyed child. It is a training or developing process and like any other form of training, such as piano playing, painting, golf, tennis or surgery, it takes a long time to produce a person who can perform well. Taken at its true value and in conjunction with the other measures used to meet the problem of the cross-eyed child or treat his squint, it is a useful and important adjunct.

What Causes Cross-Eyes

No one knows the whole story of what causes squint and why. It is frequently following some child's disease that a squint or crossed eye is noted and this has given rise to the conviction that the cross-eyes were due to the disease. This is not true. There are probably many causes for squint, or cross-eyes, but there is not real evidence that children's diseases are the specific causes. What probably happens is that the child in its weakened, convalescent state is permitted to overtax his eyes by prolonged reading of story or picture books or playing with toys held too near his eyes. The careful parent will combat boredom and restlessness of the convalescent child by introducing stories and games which involve distance vision rather than the more convenient but also more hazardous use of picture books and printed material.

Should the eyes of your child become crossed following an illness or at any other time, by all means have them examined carefully, completely and at once. The difficulty in achieving a perfect result when treating cross-eyes increases tremendously if the condition is neglected.

How Cross-Eyes Are Treated

The oculist or eye physician has five general means at his disposal for treating a case of cross-eyes or its complications. First he will make a careful test and measurement of the eyes under drops. The drops consist of medicines which relax the muscles of the eye and permit an evaluation of the amount of farsightedness or nearsightedness or astigmatism which is present. Sometimes the use

of drops alone, relaxing the straining muscles, will permit the eyes to regain their normal position. Usually further treatment is required.

The second step consists of accurately measuring and fitting glasses to the child's eyes. The effect of glasses is to focus the light properly and thus spare the eye. Glasses have been fitted to and worn by children less than a year old hundreds of times and without the slightest discomfort. I sympathize with parents who wish to avoid putting glasses on their children, but that sympathy does not extend to a willingness to jeopardize the child's future welfare for the sake of the present cosmetic and economic convenience. Frequently as the child's eyes are made stronger and its co-ordinations consolidated, the glasses may be weakened or removed. In many cases they will be required permanently, particularly if the child is to mature and live under the present conditions of our urban civilization.

The third step in treating a squint is to arouse, stimulate and develop the crossed eye. Whenever an eye turns in, out, up or down, whenever it is not directly pointed at the same object as its mate, one of two conditions must arise: the patient must see double or the image of one eye must be ignored or suppressed. Cross-eyed children do not see double—they suppress the image of the squinting eye. This is done unconsciously and the effect, if we use a telephone as an analogy, is as if the child unconsciously reached up and pulled the plug which connects the eye to the brain. The eye is open and an image is being formed in it, but the image never registers in the brain. The effect of this constant suppression is further to reduce the vision of the squinting eye, which is usually the poorer one, and as this condition persists, the ability to see with the eye is gradually lessened. By focusing the image with glasses and by covering the good eye and hence forcing the poor one to work and develop, it is frequently possible to save or restore the vision of the squinting eye.

The fourth step in treating squint is to teach the child to use his two eyes together in a normal fashion. Many instruments and procedures have been devised for this purpose, none of them so efficient as we would like. It requires the protracted, patient efforts of someone who can arouse and keep the child's interest and

enthusiasm. It is a long, arduous process—orthoptics—but one which, if used with sufficient intensity and persistence, very frequently produces amazing results.

The final step in the treatment is surgical. If the child has been conscientiously carried through the steps we have outlined and the squint persists as it will, according to the latest estimates, in 40 to 50 per cent of the cases, an operation becomes necessary. The operations are usually simple and safe. Combined with the other steps they are usually successful. The unsuccessful operations have, in the past, probably resulted from lack of adequate attention to the four other steps.

Summary

The problem of the cross-eyed child requires patience, knowledge, tact and sympathy for its solution. The cosmetic disfigurement is a serious handicap in making a normal adjustment to life. The psychological effects are bad and require much tact, sympathy and understanding if they are to be handled well and with a minimum of injury to the child. The restoration of function is an important part in the treatment. The ideal treatment and the safe way are to place the child in the hands of a competent eye physician who alone has all the accepted methods of treatment at his disposal, who can use them to fullest advantage and who, if an operation becomes necessary, can operate at the time most favorable for obtaining a perfect result.

The Social Worker in Sight Conservation*

Eleanor Brown Merrill

IN order to have greater concerted social action in safeguarding eyesight, the various threads of community activity which may in any way relate to questions of eye health should be drawn together

IT is interesting to note, in studying lay developments in prevention of blindness throughout the past 29 years, that from the beginning emphasis was put upon the social significance of visual handicaps and the responsibility of social workers in preventing needless blindness and in saving sight. That first committee in New York, from which the National Society for the Prevention of Blindness has developed, was composed of representatives from the Russell Sage Foundation and from the state and city health departments, the founder of the New York Association for the Blind, the founder of Henry Street Settlement and Visiting Nurse Service in New York—so well known over the years as in the forefront of social developments—practicing physicians and others interested in various aspects of community welfare. The first office of this committee, after a preliminary period, was established in the United Charities Building, New York City, in order that there might be the desirable association with other philanthropic activities; also, in the early months, the service of several students from what was then the New York School of Philanthropy was utilized in obtaining information as to eye accidents handled in the surgical dispensaries of New York City.

Through the years of growth in efforts to prevent blindness by the national and local organizations formed for that specific purpose, there is evident an increasing awareness of the problem of safeguarding eyesight—not as the responsibility alone of any dis-

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tinctly specialized agency or group of individuals, but as an obligation on society as a whole; in which the medical profession, public health authorities, nursing groups, educational bodies, industrial and safety organizations, and many other agencies must bear their part if the desired goal is to be reached.

Social work has come more and more into the picture, as, for instance, through actual service in the follow-up of eye cases under medical treatment and in social and educational adjustment of the visually handicapped. Of even greater portent, however, seems the permeation of social work principles and technique into the whole structure of prevention of blindness programs. In case work, emphasis is put upon the need of understanding one's client, of treating him as an individual rather than as a member of a handicapped or unsuccessful group. Are not understanding and an individual approach equally important in our community relationships and in developing that team play between organizations which is so essential to progress? As Health Commissioner of New York State, Dr. Parran once said: "In the nation at large there is more than usual need for open-mindedness, for respect for the point of view unlike our own, as well as a courageous tenacity in adhering to what is truly valuable in established methods." The social worker particularly, by nature of her profession, must weigh the value of existing activities, must see how the programs of others fit into her own plan of accomplishment, and must bring her service into harmony with the whole.

The present is a period, it seems to me, of special challenge for us all—the challenge to meet and to adjust ourselves to the complexities of an increasingly mechanized age; the challenge to establish working relationships between public and private agencies—both of fundamental importance; the challenge to uphold and improve standards of service; the challenge to utilize fully all available sources which might directly or indirectly contribute to the success of our program; the challenge to interpret fairly our aims and to influence public opinion.

I think of the social worker in a program for safeguarding eyesight as one who draws together the various threads of community activity which may in any way relate to questions of eye health, and weaves them into a pattern to be followed—not routinely, but

with flexibility—and with willingness to adapt her plan to the individual situation. Her responsibility is to secure such procedures as may lead to the greatest saving of visual loss, both through the stimulation of such service as can be properly carried by existing agencies, and through the initiation—perhaps on a demonstration basis—of such distinct and supplementary service in this field as may be needed. Among sight conservation measures which must be brought about, whatever their allocation, may be mentioned: provision of adequate eye health care in the schools; proper diagnostic service and treatment, where indicated, for all expectant mothers; proper care of infants' eyes at birth through prophylaxis, medical and nursing care and eye hygiene education; facilities for insuring eye examinations and correction for all preschool children; control of occupational eye hazards in industry; and provision of proper medical care for all eye disorders.

The aim of the prevention of blindness worker is towards the ultimate inclusion of these measures in the community program. On the schools will rest responsibility for carrying out the details of vision testing and ophthalmological examination, for establishing sight-saving classes, for perfecting the school environment in its relation to eye health. A proper control of eye conditions recommended for treatment must be secured through interplay of ophthalmologist, teacher, school nurse, social worker, clinic. Health departments, physicians and hospitals must co-operate in the provision of prenatal examinations where laboratory tests and treatment for all positive cases of syphilis are so vital a measure in the prevention of visual difficulties. Here the importance of proper interpretation to the patient is evident. She must realize the danger to the expected child, the possibility of transmission to others, the need for protecting her own eyes against possible complications. In a recent article, Dr. Exner of the American Social Hygiene Association named as a main social service function the proper instruction of patients under treatment for syphilis, whether this be during prenatal or other stages. The importance of following up contacts in the home cannot fail to be recognized. Let me cite an instance which, alas, is far from unusual.

A 13-year-old girl reported at the eye clinic of a state hospital and was diagnosed as having interstitial keratitis. Since she lived out

of town, the social worker's plan had to include arrangements for her care while under treatment as well as for bringing her family to the hospital for examination. Both parents showed positive Wassermann tests and a brother and sister were found to have congenital syphilis—though of this whole family the child with eye symptoms had been the only one recognized as needing medical care. A plan was worked out with the local doctor whereby all could receive treatment in their own community.

Upon health departments rests the major responsibility for regulations relating to care of babies' eyes at birth. Regulations, however, are far from complete unless accompanied by provisions for proper follow-up and case control, as well as by continuous education. A report came to the National Society for Prevention of Blindness recently from a southern state where five ophthalmia neonatorum cases were found through the vigilance of the prevention of blindness worker—just in time for useful vision to be saved in all of the cases through immediate hospitalization. This state requires use of prophylaxis at birth, but enforcement and education have been slow.

Medical examinations for preschool children have been made more widely available each year through the ministrations of health departments, child welfare centers, schools, day nurseries, summer round-ups under the parent teacher associations, etc. In these examinations, increasing recognition is being given to the question of eye health and to the possibility of preventing the development of serious eye difficulties by giving early attention to minor or incipient troubles. The following case illustrates the opportunity through a case work approach for more than correction of the immediate difficulty.

An Italian boy of six years, when given a vision test in kindergarten, was found unable to distinguish any but the largest symbol on the chart. When brought for ophthalmological examination, there was found good reason for his backwardness in kindergarten and his failure to concentrate on any but hand work. The immediate vision difficulty was helped with glasses, and the change in this child's personality and alertness was marked. Moreover, the family, hitherto unresponsive to any efforts of the social worker to straighten out certain complications and secure indicated medical treatments, became fully co-operative and awoke to what might be

accomplished through proper attention. There was an appreciation of the boy's improvement which changed the entire family's attitude.

To secure proper medical care for all eye disorders is an ambitious aim, but none too ambitious in view of the high incidence of blindness and impaired vision caused by ignorance and neglect. Hand in hand with medical science must go the interpretation of factors involved in the disease and its treatment. There must be adjustment of social and economic difficulties obstructing the road to successful results, the securing of continuous care when required through establishment of confidence and through the necessary follow-up.

The hospital social worker has a very distinct part to play. In the clinics she has opportunity to work with the ophthalmologist, to learn his opinion in regard to the case and what its implications are for the future. She must relate this knowledge to her social plan for patient and family. Reference to a glaucoma patient under treatment in one hospital clinic indicates the wide range of factors which may be involved.

A Spaniard needed first of all a Spanish interpretation of her condition in order to allay the fears induced by her language difficulty. There was needed on her part a re-establishment of confidence, and on the part of the doctor an explanation of the patient's unresponsiveness and emotional upset. The relief agency required interpretation of the patient's medical needs and occupational limitations. Finally, after two operations, there was the need for referring this patient to a doctor in her home town for continued care.

That the social worker has a real contribution to make in decreasing the loss of sight from glaucoma has been evidenced in a study conducted over a number of years at Massachusetts Eye and Ear Infirmary in Boston, through the assignment of a worker in the social service department to follow all glaucoma patients in order to prevent lapses in treatment and to secure the fullest possible co-operation from patients. In a period of seven years the number of cases under care increased from 200 to over 1000, of which 654 were of primary type. Of these last, who reported to the clinic regularly from year to year, only 51 had to be referred to the Divi-

sion for the Blind—a telling result in view of the disastrous effects upon eyesight of this disease if left unchecked.

Though social case work as it relates to glaucoma patients may offer particularly graphic results, yet the value of this approach cannot be limited to any one type of eye disease, nor to any group of individuals. The social worker may or may not be present in clinics to handle the eye cases calling for follow-up and adjustment. It is encouraging to note that hospitals are more generally recognizing the worth of such service, and that it is on the increase. However, eye patients must not be allowed to suffer loss of sight for lack of hospital social work, and vision must not fail to be saved for lack of an understanding and a willingness to participate in the program. Family workers, public health nurses, teachers, volunteers—all have their part to play, and the eye social worker has a peculiar responsibility in providing what is needed in the way of instruction and interpretation. The call is for united action; for supplementing as we can the services of others in joining in a common cause through contributing what may be thought of as a special technique to the whole program for community welfare.

Eye social work, as we conveniently term it, is not new, though of late years more emphasis has been put upon special preparation for those entering this field, and upon the importance of education in the various aspects of a sight-saving program. As with all constructive efforts, there must be knowledge of the reason for action, appreciation of the results of failure, understanding of the technique to be employed. With general awakening of interest and intelligent comprehension of the problem, may we not look to ever greater concerted social action in the field of safeguarding eyesight?

Factory Lighting and Accident Prevention*

E. W. Murray, M.I.E.E.

SPECIFIC examples of the need for good illumination in order to relieve the high and unnecessary expenditure of energy which always accompanies a badly designed or glaring installation

I DO not propose to deal with the subject of industrial illumination in any of its more technical phases, but rather from the common-sense point of view, embracing methods which have been found in practice and have had to be altered to achieve the desired results; ideas which are being used with much benefit to the workers; and also a forecast of what might be expected in the future as regards both artificial and natural illumination.

Education in Illumination

In the first place, illumination education proceeds at a very slow pace. It is true that progress made during the last ten years in shop-window and display lighting has been great, and much the same might be said about street and decorative lighting in the theatre and cinema, and in some homes, but it appears to require a further period of years for the improvements in the home to be adapted to the requirements of lighting in factories, and unfortunately the same progress has not taken place there. It cannot be hoped that factory lighting should follow the lines of cinema lighting, for instance, but there are a number of points of principle that could be followed with great advantage. The usual complaint, when improvements are suggested for the illumination of a factory, is that there is no money to spare for such services, but since the same excuse is usually given for any suggestion whatsoever, it is

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only by mentioning the matter a sufficient number of times that some improvement is attempted. The same might be said about machine guarding generally, but eventually, when the guards are fitted, it is frequently said, "Why haven't we done this before?"

Accuracy in Fundamentals

Be sure of your ground when you are putting forward a scheme for improvements in illumination. It is so easy for a superior to turn a scheme down and, in many cases, it is because the persons putting the scheme forward have not made themselves conversant with the particular matter. Try to see clearly the objects which the operatives are expected to see under the worst conditions, or at the end of the day, when the nerves may be a little overwrought. A casual glance is useless. It is an easy matter to strain one's eyes for a short time, but do so for hours on end and you will find that it is little wonder that some operatives complain of eyestrain and headache. If this method is adopted, you will be able to deal adequately with the refusal to approve a scheme.

Remember, also, that no amount of illumination will ever correct a person's defective vision, so that one's scheme will be for persons who have normal vision, or vision corrected to normal by glasses. In addition, adult workers will generally require more illumination than juveniles since the latter have a keener sense of vision.

You will also want to know something about the amount of illumination required for some particular class of work. A number of guides can be obtained from the usual gas or electricity concerns giving suggested illumination values for practically every industrial process. A guide is issued by the Illuminating Engineering Society, and two others by H.M. Stationery Office. These latter give the findings of the Departmental Committee on Lighting in Factories and Workshops. These reports should be in the hands of everybody who has authority in any business, since they give the minimum standards of illumination for all kinds of work. It must be emphasized that the figures in the Government reports are the minimum illumination values only, while the other figures are a guide for designing new installations. Lamps and mantles age and get dirty or broken, burners fill up with dust, reflectors discolor and become dirty, and, in times of heavy load, the gas pressure or

voltage falls. All these items seriously decrease the illumination with little or no reduction in the running cost. So that, if you design an installation from the minimum figures, making allowances for the aging of the light sources, the discoloring of reflectors, etc., I think you will find that you have arrived at an initial figure which will indicate that the figures referred to in the Government publications are only apparently low.

Good illumination is a real necessity in order to relieve the high and unnecessary expenditure of energy which always accompanies a badly designed or glaring installation. Many instances can be cited where improved illumination has resulted in an increased output, and these improvements must have been accompanied by a reduction in fatigue. In one case I have in mind an increase of about 15 per cent in output was obtained when the illumination was raised from 5 to 23 foot-candles. Further, I hope to show you how much easier and quicker work can be seen when the illumination is increased, even where rough work is being performed which calls for very little discrimination.

Natural and Artificial Lighting

Now, this does not mean that the intensity of the artificial lighting need be as high as that of natural illumination, but we should try to copy at least the qualities of natural lighting, so that the best lighting scheme that can be adopted is good general lighting. On the other hand, however, the design of a building, or the position of the windows, may adversely affect the natural illumination of a room, yet we seldom hear of complaints about natural lighting, and trouble from this source is frequently overlooked. It is important that natural and artificial illumination should be considered together.

In one factory, which is top lighted, a number of power presses are fixed in rows along the shop and parallel to the top light. Now, the overhead gear at the top of the power presses throws shadows on the working areas or dies, and the illumination readings taken during natural lighting were 65 foot-candles in the gangways outside the presses and 0.75–0.6 foot-candles on the dies. These readings were taken on a dull, rainy day and it was interesting to note that it was on such days as these that complaints were made

by the operatives. Naturally, the management pooh-poohed the idea because they had viewed the complaint from the general illumination in the shop, and not from the operatives' viewpoints. Further, the operatives had to look through the power press guards to endeavor to see their work. The brightness on their side of the guards was naturally higher than that on the dies or the work within the guard. The trouble was the high degree of contrast. This is a case where artificial illumination of a high order is required on the dies during daylight, in order to reduce the illumination contrast in the operative's field of vision. Following up this idea, the high artificial illumination on the bottom dies, if used during the dark hours, would have required, in turn, a reasonably high artificial illumination in the shop, or the contrast would have persisted—but in the opposite direction—so it follows that the illumination on the dies should be equal to, or a little higher than, that of the general shop area. This could perhaps be remedied by using the double filament lamps used in the motor industry for head lamps.

Requirements in Certain Industries

It is found that factory occupants are not always aware that the provision of suitable and adequate lighting is called for in many of the regulations made under the Factory Acts. The following are some of the industries mentioned: building, ship-building, fruit preserving and in dock premises, together with certain requirements as to lighting where locomotives and milling machines are used. Further, in factories where woodworking machinery is in use, the regulations call particular attention to the need of good illumination, both natural and artificial, and they also stress the disadvantages of shadows. I know you will appreciate the increased accident risk that is likely to arise through poor illumination, or shadows, with such high-speed cutters, saws, etc., as are used in the woodworking industry and that there is still a fair amount of work yet to be undertaken before industrial lighting can be considered satisfactory. A chart exhibited in the Home Office Industrial Museum records monthly the reportable accidents in factories and workshops. The increase in accidents during the winter, or the months when artificial lighting is necessary, is very noticeable—a large proportion of these accidents being due to persons falling.

Imperfect Lighting and Accidents

The disposition of lights for a working area should be carefully selected and placed so that the operative is not troubled by shadows of parts of the structure, or even of himself, and particularly by shadows of moving objects. We must not lose sight of the effect on one's nerves and the consequent fatigue involved in the presence of an erratic, moving shadow. A flickering light, due to quick variations in mains pressure, may be just as nerve-racking as a moving shadow, and this is not an uncommon fault to be found in factories. Instances of this nature occur in both gas and electrical installations. In the case of the latter, the trouble is usually due to a bad joint in the belt or the need of a flywheel to smooth out the speed variations of the works transmission gear.

Shadow Conditions

But shadows are not always undesirable. In a few industries they are necessary in order to show details, in very much the same way that an architect depends on the shadow effects produced by the sun on his building.

A typical case of this nature is drilling, and the following case which was investigated may help others to avoid the same mistake.

A section in the drilling shop of an engineering works had been rewired for a general lighting scheme of some 8 or 9 foot-candles of illumination. The old scheme consisted of individual lights at each machine, some machines having portable leads and hand lamps without reflectors. The drillers' complaint was that they could not see their work as easily as with the old scheme. The trouble here was entirely due to the good general lighting scheme. The indentations made by the center punch marks ("center pops") were as evenly illuminated as the surface of the metal, so that the drillers had to find the indentations with their fingers and then to move the drill and the center punch marks in line. A pocket battery hand lamp indicated the usefulness of directional lighting by illuminating one side of the center punch marks more than the other. This showed the drilling marks quite clearly.

Directional lighting is necessary in all cases where the unevenness of a surface is the point of importance, as in printing, embossing, weaving, goffering, fustian cutting, drilling, carving, etc.

The provisions of proper illumination on the work can influence the efficiency of guards for many dangerous operations on machines. We may have the case where the shadows thrown by the guards are a disadvantage. If wire mesh guards are used, it is quite possible that shadows will not be so sharp if general lighting is installed. It would be quite different with individual lighting. We must remember also that any lighting scheme will give a higher illumination on the outside of the guards than on the work within the guards. Where there is any form of screen between the operative and his work, some form of lighting should be provided on the side of the screen remote from the operative. I want to lay stress on the importance of directing the light on to the work in the same direction as that in which the worker is looking. To install lights at the back of the machines is very bad practice, because the operative has to contend with the reflected glare all the time that artificial lighting is in use.

A glaring light is always a hindrance to vision and distracts from an otherwise adequate illumination level. Lights without reflectors, or the use of shallow reflectors on the light sources, should never be allowed. In fact, the light source should be one of those things that the eye should not see. Artificial lighting is not alone in causing this trouble, and if the windows are on the sunny side, great care is needed in the placing of machines.

Very Fine Work

Where work of a very fine nature is executed, it is not always possible to overcome the difficulty of seeing the work by illumination alone. If one attempts to see the fine details of the threads in woven silk, or artificial silk, or the fine wires used in wireless components, or even in burling and mending, it will be found that the object has to be held quite near to the eyes—say, some 6 to 9 inches—and many workers are now being provided with special magnifying spectacles. This problem was the subject of a special investigation by Mr. H. C. Weston, of the Industrial Fatigue Research Board (now the Industrial Health Research Board), and is very ably explained in Report No. 49 on "The Relief of Eye Strain among Persons Performing Very Fine Work," published by the Stationery Office. The principle employed is, in a measure, the

use of magnifying lenses, and when these are properly and correctly fitted to suit the individual worker's normal vision, they afford a marked help to the operatives in reducing the fatigue of the eye caused by the angle of convergence and accommodation.

Inspection of Polished Surfaces

The detection of flaws, scratches or blemishes on highly polished surfaces which are large in area and flat has been the cause of a number of complaints of eyestrain and fatigue. These polished surfaces reflect the source of illumination upward into the workers' eyes, and the trouble is caused by the contrast in brightness seen on the surface. It is necessary, therefore, to provide light sources having large areas. For very large sheets a type of inverted trough about three feet wide and nine feet long, fitted with a translucent screen below the lights, has given satisfaction. The illumination brightness of the screens used is about 3 to 4 foot-candles per square inch. This figure could, perhaps, be increased a little, but to not more than 5 foot-candles per square inch.

Low Voltage Lighting

The provision of small low voltage lamps with reflectors for illuminating the working area of machines is steadily increasing. This method of lighting can be used to advantage on almost any type of machine and is a useful asset in giving the worker some illumination in an area where it is most needed. The more general method of obtaining the low voltage is the use of the double wound transformer which may be attached to particular machines so that the voltage drop on the secondary winding is negligible. If the secondary winding is designed for 12 volts, "bus" lamps should be used because they have a longer life than motor car lamps though they are a little less efficient, i. e., they take more current for the same illumination. To summarize, the advantages of this form of lighting are:

1. Being small, the lamps and reflectors can be placed between the worker and his work, the beam of light being thrown in the direction in which he is looking, so that he is not subjected to reflected glare from the wet, oily or shiny surface of the work or of the machine. (The reflected glare is always away from the worker.)

2. The light can be placed in the optimum position.

3. Current consumption is low, and maintenance costs for renewals are also low, compared with normal voltage lamps.

4. There is little risk of electric shock, particularly if one of the secondary terminals is "earthed."

Some manufacturers of machine tools, woodworking machinery and sewing machines have incorporated a light of this nature in the design of the machines. And, in cases where the machines are electrically driven by A.C. power, the motor stator may form the core of the transformer, and a coil (the secondary) may be inserted into a slot milled into the outer side of the stator. The ends of this coil are taken to two terminals on the motor frame from which the light supply can be obtained. This low-voltage local lighting should never be the only lighting in a room or factory. The suggested method is to provide, in addition, general lighting of 2 to 10 foot-candles, according to the requirements.

Lighting of Textile Processes

Even quite recently, in a few lace factories in the Midlands, the use of candles was fairly general. All the threads on the lace-making machines have to pass through separate holes in a type of guide or reed plate which is placed about two feet from the floor at the back of the machine. The machines are generally placed back to back and, because of the overhead mechanism and the side frames, there is little natural or artificial illumination available from the normal room lighting. The workers, in order to repair a broken thread, resorted to holding a small metal plaque between the lower joints of the first and second fingers of the left hand and a lighted candle was affixed to the center of the metal plaque. Great care was needed not to set alight the nearby threads with the candle.

The latest development for lighting this class of work is to install permanent lights with small trough reflectors within the machine or, alternately, to use portable low-voltage handlamps, provided with a ring to fit over the middle finger, or a loop to go over the hand.

The threading of reed frames for looms is another case where an improved method of lighting is required. I have not yet seen a

good installation. During the daytime the operative sits with the work between him and a window, across which is stretched some white gauze or tissue paper, and in this way the heels in the reeds can be seen and threaded easily. There is no reason why a more-or-less translucent screen, illuminated from the back with lights and suitable reflectors, should not be used during the dark hours.

Artificial Daylight

Artificial daylight is more constant than natural lighting. Such lighting, however, should be confined to special areas where some kind of inspection of colors or goods, for example, is being made. A general artificial-daylight lighting scheme for a large room is often found to be rather cold and depressing. The inspection of razor blades is one operation for which it has been found suitable, the inspection usually being carried on in small cubicles, each with its own light and lined with black velveteen.

Natural Lighting

The tendency in modern design of factories is to increase the area of the windows and, while this is very satisfactory from the safety, health and welfare sides, generally some special treatment is necessary during the few hot summer days to reduce the heat and glare from the sun. In winter, also, the large expanse of glass calls for the provision of additional heating. The effect of the sun's glare and heat can be reduced by color-washing the glass, or improvising blinds on the outside of the windows. In some cases a permanent canopy of suitable width has effectively shaded the upper portions of windows, and in others the use of radiant heat-resisting glass has proved satisfactory. One of these glasses also proves to be a very satisfactory light disperser and has the advantage of presenting a good, white surface on the inside. It is, therefore, a good reflector for artificial illumination during the dark hours.

Dispersive, or prismatic, window glass is not used to the extent it should be. In many old buildings, where the ceilings are low and the rooms deep, these types of glasses can provide valuable improvements in natural illumination. With clear glass the angle at which the light reaches the tables or benches at the back of the

room is a frequent cause of complaint because of the contrast within the field of vision. Dispersive glass prevents this trouble.

Maintenance

The truth of the old statement, "Soap and water are cheaper than the energy required to provide light," is not yet fully realized. This applies equally to windows, lamps, reflectors and shades, and I know factory occupants who have been astounded at the increased illumination after a thorough cleaning of the light units. Such demonstrations are usually better accomplished with the aid of a light meter, and, as an outcome, firms have purchased light meters which are passed on to the managers of the different shops, with a log book. The illumination readings at specially selected points in each shop are recorded monthly, or bimonthly, and in this way those concerned with the cleaning and the renewal of aged lamps are able to deal with them before the illumination becomes too low.

What Does the Student of Institutions for the Education of Teachers Know About Eye Health?*

Anette M. Phelan, Ph.D.

IN giving an exposition of the results of a test taken by 887 students in 12 teachers' colleges, the author explains the need for a more searching form of test

STUDIES recently published by the American Child Health Association[1] indicate a high incidence of visual defects among school children, the ineffectiveness in the school programs for the detection and follow-up of visual defects, and the fact that the classroom teacher holds a strategic position in the program.

A recent review of school health practices[2] reveals the fact that eleven states have made mandatory provisions for the testing of vision by teachers and six others have made provisions of one sort or another for delegating the testing task to the teacher. Only one state requires by statute that the institutions for preparing teachers instruct them in vision testing.

A survey[3] of the curricula of a group of institutions for the preparation of teachers in the eastern states disclosed that of the group studied, only those required by law to do so offered instruction in vision testing to their students.

The writer investigated the required curricula of 10 institutions for the preparation of teachers in 7 states and held personal con-

* Presented at the Annual Conference of the National Society for the Prevention of Blindness, Columbus, Ohio, December 4, 1936.

[1] Franzen, Raymond. *Evaluation of School Health Procedures*, American Child Health Association. New York: School Health Research Monographs, No. V, 1933.
American Child Health Association. Physical Defects—The Pathway to Correction, 1934.

[2] Rogers, J. F. *Statewide Trends in School Hygiene and Physical Education.* Washington: U. S. Office of Education. Pamphlet No. 5, 1934.

[3] Spencer, Mary E. *Health Education in Teachers Colleges and Normal Schools.* New York: Teachers College, Columbia University, 1934.

ferences with the faculty on the subject matter content of the curricula. The evidence indicated that when other demands had been met, there was left but a minimum of time for attention to the eye health problems of the school child. There was no opportunity for determining whether the use of the limited time allotted for consideration of eye health problems equipped the prospective teacher with the essential information and skills.

A survey of eye health problems in the service area of some of the institutions for the preparation of teachers revealed conditions that could hardly have existed where teachers were familiar with the facts related to eye health of children. Some of the conditions commonly found were:

Classroom window shades were drawn to cover the upper third or half of the windows;

The space near the window was used for tables, fern stands, lockers, etc., while schoolroom desks were arranged on the dark side of the room;

Desks were arranged in hollow squares, with some children working in their shadows and others facing the window;

Nearsighted children were seated towards the rear of the room;

Children showing effects of eyestrain were seated in a part of the room not well lighted;

Assignments on blackboard were placed on glare areas or in dark corners;

Glass-covered pictures were placed on front wall of classroom;

Children rated on intelligence or achievement on results of paper and pencil tests taken in poorly lighted sections of the room;

Children were rated on achievement or intelligence by means of paper and pencil tests without an investigation of vision status;

Young children were subjected to drills requiring close eye work, namely, quick recognition of symbols and words on their printed pages;

First-grade children were imbued with a sense of failure over their inability to meet artificial reading standards set for promotion to second grade;

Teachers were unable to administer a routine vision test with the Snellen chart and lacked an understanding of limitations of the test or significance of the results;

Teachers were ignoring observable behaviors and conditions of children which suggested the presence of visual defects.

The presence of the problems discovered in the survey, together with the consideration of the results of the earlier studies, indicated the need for an instrument which would effectively separate the facts on eye health of children known to teachers from those not known. With that in mind, a preliminary objective test of the true-false type was constructed, with one false statement to four true, and a two-to-one ratio between specific statements of fact and statements of popular interpretation.

The facts to be tested were selected from *Conserving the Sight of School Children*.[1] This report was selected as a basis for the test inasmuch as the manuscript had been given the benefit of approval by 100 specialists in health and education, including 25 ophthalmologists on the executive board and advisory committee of the National Society for the Prevention of Blindness.

The facts selected dealt with the mechanism of vision, its growth and development; the prevalence of common visual defects among school children; the characteristics of visual defects and their significance to school achievement; the instruments used for routine vision tests; the limitations of the tests and the significance of the results, as well as the proper conditions under which the test might be used; the standards for adequacy of illumination of a classroom; and the factors conditioning the adequacy of illumination and the characteristics and sources of glare.

The test questions lent themselves to classification into four groups, each dealing with a definite area of information, as follows: Group A, visual defects: recognition and measurement; Group B, the visual mechanism—its growth and development; Group C, influences of visual defects on children; Group D, environmental factors in vision.

It was hoped that through the use of the test we could determine what knowledge on eye health the graduate of a teachers' college possessed. The test was given to about 900 college seniors in 12 teachers' colleges. The papers were scored and the responses tabulated and analyzed by the statistical bureau of the Metropolitan Life Insurance Company. Table I indicates the results.

[1] Published by the Joint Committee on Health Problems in Education of the National Education Association and the American Medical Association with the co-operation of the National Society for the Prevention of Blindness. Revised, 1935.

The evidence in Table I suggests that if the test was reliable, seniors in teachers' colleges know more about the eye health problems of children than we have believed. However, correct response to popular interpretation was consistently higher than to precise statements of fact.

Areas of information covered by the test and types of statements in each area	Number of Statements by Type			Per Cent Correct Response by Type of Statement		
AREA	Precise*	Popular†	Total	Total	Precise*	Popular†
A. Recognition and measurement of visual defects	19	6	25	64	57	87
B. The visual mechanism, its growth and development	28	3	31	64	64	79
C. Influences of visual defects on children	6	11	17	87	90	86
D. Environmental factors in vision	12	15	27	81	77	85
Total Nos.	65	35	100	73	67	85

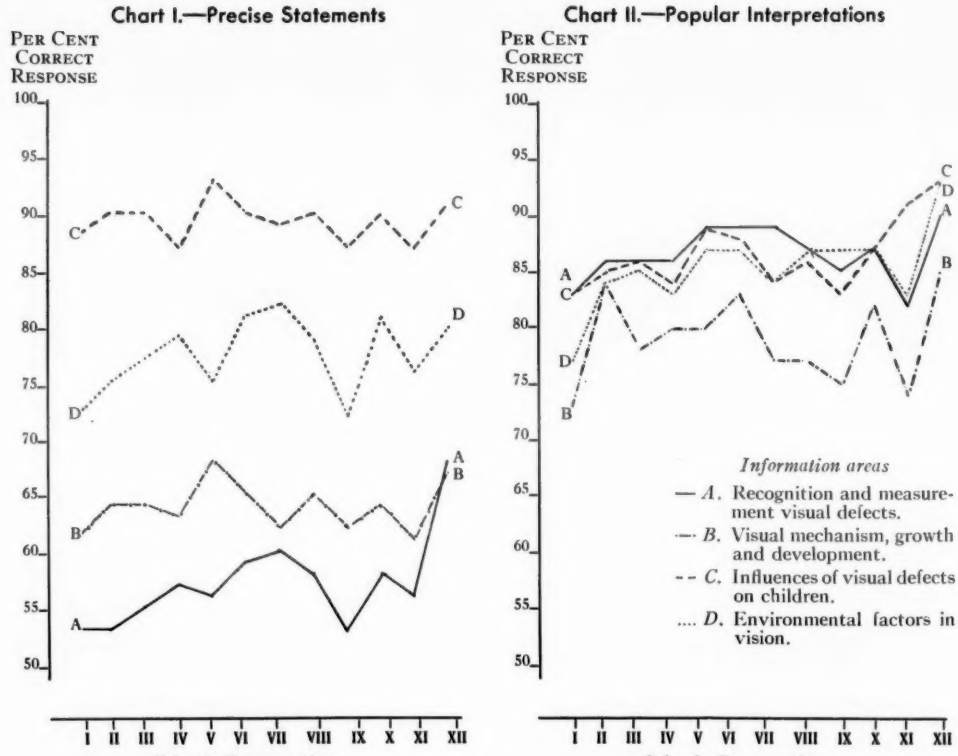
TABLE I.— Analysis of correct responses to the objective test on eye health problems of school children by 887 students of 12 teachers' colleges. January–May, 1936.

* Precise statement of fact.
† Popular interpretation.

A comparison of correct responses by schools to the four areas of information showed that, with two exceptions, the seniors of the different colleges appeared to be fairly even in their knowledge and that the number of correct responses to area C was about 90 per cent; D, slightly below 80 per cent; B, between 60 and 70 per cent; while A was between 50 and 60 per cent. This is shown clearly in Chart I. When Charts I and II are compared, it is evident that the response to popular interpretations tends to be higher than to precise statements.

An analysis of test results suggests several weaknesses of the tests as follows:

a. The number of precise statements of facts should have been comparable in the four areas of information. The predominance of popular interpretations in one area had the effect of making it appear that students knew more about that area than about the others. The truth is that in the area



Percentage of Correct Response to Questions on Eye Health Problems of Children by 887 Students in 12 Teachers' Colleges

in question (the influence of vision on the child's development and achievement) research has not been as productive of convincing evidence as it has in the other areas.

b. The true-false test in itself is probably less searching than some other type.

c. The predominance of true statements—ratio of four true to one false—may have favored the correct response. Half of the false and four-fifths of the true statements had a correct response from more than half the students.

A valid test should reveal the real status of student knowledge of the facts incorporated. It is my belief that the test as a whole did not do this. I believe, however, that some of the items in the test did. Since these items incorporated fundamental facts, I should like to call your attention to them.

*55** No. 25. Early discovery of the tendency to use one eye is one of the first steps in the prevention of farsightedness.

*67** No. 35. The power of blending the two images develops in the brain of the young child.

*14** No. 97. The perception of depth develops normally throughout the first twelve years of life.

The adult responsible for young children needs to be aware of the fact that the eyes of children are growing; the mechanism of vision and visual perceptions normally are, in the developmental period, subject to interference and warping. Yet the response to item number 97 reveals that only 14 per cent of the students were aware that the nursery school and kindergarten age period is important in the development of depth perception. Little more than half the students were aware of signs of interferences with fusion.

*23** No. 21. In nearsighted eyes, the outer coat of the eyeball usually is lacking in toughness.

*61** No. 11. The eyeball of the nearsighted child is relatively long from front to back.

*59** No. 77. In the nearsighted eye, the distance from the front curve of the eyeball to the retina is greater than in the eye with normal vision.

* The figure at the left indicates the percentage of correct response to the item.

Schools of ophthalmology are not in complete agreement as to the specific relationship of school work to progressive myopia. The unsettled questions deal with (a) the influence (in extreme convergence) of convergence muscles on the shape of the eyeball, and (b) the effect of gravity pull on the shape of the eyeball when the head is bent forward and the face is held close to the desk. Yet ophthalmologists are agreed that myopia is closely associated with a lack of toughness in the outer coat of the eyeball; also that a reduction of close eye work is advisable and outdoor life desirable for nearsighted children.

Yet the response to item number 21 indicates that less than one-fourth of the students knew that a lack of toughness of the eyeball was an important element in nearsightedness, and according to the responses to numbers 11 and 77, a little more than half knew the relative distance from the corneal curve to the retina in nearsightedness and farsightedness.

*56** No. 78. The normal field of vision on the temporal side extends 90° from the line of direct vision.

*67** No. 98. When desks are arranged parallel to the window wall, the field of view of the children includes the windows.

A narrowed field of vision is a distinct handicap to an individual in that it constitutes a safety hazard and disqualifies him for many occupations. It may also be associated with a serious condition and calls for prompt observation by an ophthalmologist.

Yet the response to number 78 showed that slightly more than one-half the students knew that the width of the normal field of vision was equal to the diameter of a half circle lying in the horizontal plane in front of the shoulder line.

A field of vision of normal width indicates that eye efficiency and comfort depend upon the absence of a bright light within the field. Half the students were able to apply this fact.

*38** No. 19. The muscles of accommodation cannot clarify the image of the farsighted child.

*26** No. 5. The visual defect most frequent among school children is farsightedness.

* The figure at the left indicates the percentage of correct response to the item.

The farsighted child uses the ciliary muscles to clarify distant images. An increased burden is placed on the ciliary muscles when such children attempt to clarify the image of nearby objects. These facts hold implications for adjustment of relative demands of learning through first-hand contact and through the use of the printed page, and for relatively short periods of close work; also for an understanding that prolonged close work for children may result not in retinal fatigue but in fatigue of the ciliary muscle. Yet slightly more than one-third of students responded correctly to number 19, and according to the response to number 5 only one-fourth of the students suspected the incidence of farsightedness.

*54** No. 58. Rays of light from a point 20 feet distant are practically parallel.

*54** No. 24. In testing distant vision, the test chart is placed 30 feet away from the subject to be tested.

*58** No. 7. The normal mature eye needs to make no muscular effort to get a clear image of objects 20 feet or more away.

Rays of light from any point 20 feet, or 6 meters, distant enter the eye practically as parallel rays. This fact is important in that 20 feet is the nearest distance at which the normal mature eye can get a clear image with the ciliary (accommodation) muscles at rest. For this reason the distance (20 feet) is the nearest point at which distant vision can be tested.

This fact holds implications not only for careful measurement of distance for the vision test but also for the intelligent selection of activities involving distant vision. Yet the responses to numbers 58, 24 and 7 indicate that one-half of the students knew the facts regarding rays of light and that about one-half could apply the facts to the placement of the chart for testing distant vision.

*47** No. 92. The human eye responds more favorably to a mixture of daylight and artificial light than to artificial light alone.

*48** No. 86. On winter afternoons, the light fades from the sky at a rate more rapid than that at which the human eye adjusts to the change.

* The figure at the left indicates the percentage of correct response to the item.

The teacher is in a strategic position for adjustments necessary to provide adequate light of good quality for the classroom. She should know not only the reasons for using daylight whenever possible but also when it is important to use artificial light in the classroom. Yet less than half the students knew that the human eye responds favorably to a mixture of daylight and artificial light, or that there was a real reason for turning on the artificial light early on winter afternoons.

*58** No. 34. The Symbol E chart cannot be used to test the vision of children who cannot read.

*56** No. 80. The routine distant vision test in current use in schools is very effective in detecting farsightedness or astigmatism.

*52** No. 63. A visual acuity rating of 20/30 represents a visual efficiency of about 60 per cent.

*42** No. 44. An intensity of from 7 to 10 foot candles is a good level of illumination for a vision test.

Some states provide by statute that classroom teachers assume responsibility for vision testing; others, that the teacher shall participate in the activity. Yet according to the results of the test only about half the graduating class in teachers' colleges understand the use of the Symbol E chart, its limitations or the significance of the results; while less than half know that there is a desirable level of intensity for the vision test. There may be some excuse for the low per cent of accurate response to number 44, since that information probably has not been widely spread as yet; but the information inherent in numbers 34, 80 and 63 should have been in possession of all prospective teachers.

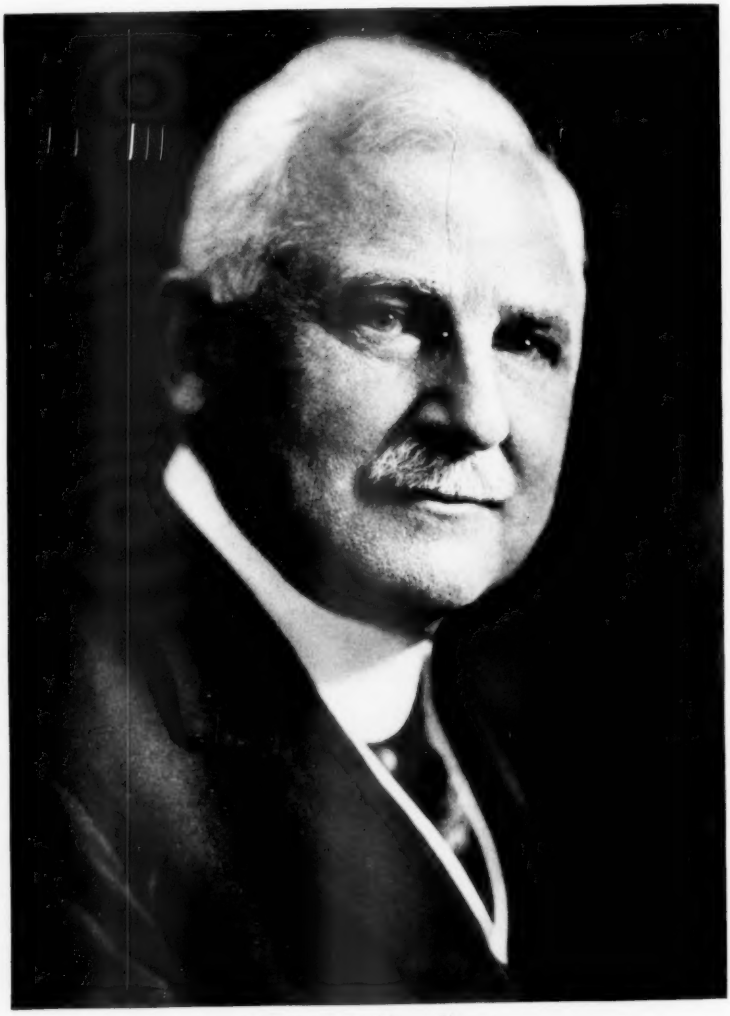
Since the survey of a selected group of items reveals a lack of student knowledge of fundamental facts related to the eye health of children, I believe that a more searching form of the test would give a true picture of student information.

With that in mind, a revised test in a form more searching than the earlier one is presented. True-false items are used only in instances where the fact does not lend itself to a good test item in the multiple-choice form.

* The figure at the left indicates the percentage of correct response to the item.

In the new form test each area of information is represented by the same number of items; whenever possible, the test item deals with a precise fact instead of a popular interpretation; and an attempt has been made to select items dealing with functioning facts rather than those that are purely academic.

It would be interesting to use the improved testing instrument with teachers in service and with seniors of teachers' colleges. The results of a study with such a test given to the seniors of institutions for preparing teachers might furnish an index by which we could determine what the graduates of such institutions should be expected to know about the eye health of children.



Edward M. Van Cleve
1867–1937

Editorial

Edward M. Van Cleve*

THE impetus to prevent a difficulty has, from time immemorial, grown out of a preceding tragedy. It was because of his experience with the blind that Edward M. Van Cleve felt the urge and the necessity of preventing further tragedies of darkness.

When, in 1915, the New York State Committee for the Prevention of Blindness and the American Association for the Conservation of Vision joined forces to establish a national lay organization for the prevention of blindness, Edward M. Van Cleve was the logical person to serve as its managing director. From that time forward he gave of his experience, his interest and his untiring effort to the accomplishment of the aim of the national organization—for eight years as managing director and since that time as a member of the board of directors and the executive committee. The very life of the organization, in the critical period following the World War, was saved through the determination and self-sacrifice of Dr. Van Cleve.

Under his direction the work of the original State Committee spread into a great national movement, and it was because of his mental vision, the physical counterpart of which he labored to protect for others, and through his wise counsel, that the National Society was able to weather the financial difficulties of the early thirties.

The members of the board of directors, the executive committee and the members of the staff who worked with him through the years realize that the foundation he laid is the basis for all new building in preventing blindness and conserving sight. This is the only monument he would desire, and in recognition of his achievement the board of directors, this twenty-seventh day of May, nineteen hundred and thirty-seven, spreads upon its records this minute in memory of one who brought light for darkness.

* Resolution adopted at the regular meeting of the board of directors of the National Society for the Prevention of Blindness, May 27, 1937, following the death of Dr. Van Cleve on May 21.

The Forum

THIS section is reserved for brief or informal papers, discussions, questions and answers, and occasional pertinent quotations from other publications. We offer to publish letters or excerpts of general interest, assuming no responsibility for the opinions expressed therein. Individual questions are turned over to consultants in the particular field. Every communication must contain the writer's name and address, but these are omitted on request

Blindness Prevention*

It has been estimated that the financial cost of blindness in the United States, including loss of earning power, is in excess of $40,000,000 a year and that in three out of four cases blindness is preventable by present known means. It may be caused by disease or by accident. Among the specific diseases leading to blindness the foremost are cataract, atrophy of the optic nerve, ophthalmia neonatorum (babies' sore eyes), glaucoma, trachoma, and progressive myopia. Less frequent troubles are disorders of the retina, cornea, iris, and choroid, as well as cancer and amaurosis. Among the more general affections leading to blindness are measles, meningitis, scarlet fever, and influenza. Venereal diseases are directly and indirectly responsible for a considerable amount of blindness in both acquired and inherited forms.

External injuries causing blindness result from flying objects, explosives, falls, cutting and piercing instruments, and so forth. Also included are foreign substances in the eye, poisoning (together with the action of chemicals), exposure to heat, and others. In addition, structural defects or malformations of the eye are to be numbered among the causes of blindness. There is ample evidence that hereditary influences play an important part in some cases. From what is known, however, there seems to be little more danger of the transmission of blindness from parent to offspring when both parents are blind than when only one is without sight.

On the whole, the outlook for the prevention of blindness is encouraging if proper action is but taken. Much threatened blindness might be warded off by skilled medical or

* Reprinted, with permission, from the *Social Work Year Book, 1937*, Fourth Issue, pp. 43, 44.

surgical treatment; infectious diseases could be brought under further control; and such serious causes of blindness as cataract and glaucoma might be made to show an appreciable decrease by suitable treatment and with greater attention to general health. One form of keratitis (inflammation of the cornea) might be curbed by better nutrition and sanitation; another, by more thorough-going control of syphilis. Trachoma, an outstanding cause of blindness in some areas, has shown itself amenable to a definite program for its eradication, including improvement in dietary and sanitary standards, better reporting and follow-up of cases, periodical examinations of suspected persons, and establishment of hospitals in infected areas.

Ophthalmia neonatorum, formerly a widespread cause of blindness among children, is yielding to the attacks being made upon it and is now responsible for only one-fourth as much blindness as it was 30 years ago. Laws requiring the use of silver nitrate in the eyes of babies at birth, the reporting of all inflammatory eye cases in young infants, the providing of prophylactics, and other measures have been extremely effective in the reduction of this disease.

Safeguards for the protection of the eye are in continually greater use in factories, while industrial workers are being increasingly taught the importance of safety measures. A healthy public opinion is being created with regard to the hazards connected with fireworks. Better lighting is appearing on every side—in homes, schools, business buildings, and factories. Examination of the eyes of school children is a part of every well-regulated school health program.

Sight-saving classes for children with vision too seriously impaired to permit their beneficial attendance at regular classes, but who can use their eyes in reading of large type under advantageous conditions, were first introduced in the public schools in 1913. There are now almost 500 such classes in various schools throughout the country.

The National Society for the Prevention of Blindness is the one national organization concerned solely with this work. It stimulates research; promotes popular education upon the subject through lectures, exhibits, films, and so forth; encourages the provision of medical social service in eye hospitals and clinics; conducts institutes and consultation service for public health nurses; assists in the establishment of sight-saving classes in schools; carries instruction in eye health to teacher-training institutions; assists in the establishment of state and local programs for prevention; and encourages the enactment of appropriate legislation. There are also a few state and local organizations which are doing valuable work. The medical

profession, both individually and in formal associations, is attempting to meet its responsibilities in sight conservation. Notable service is also being rendered by agencies of public health, industrial safety, and public welfare. Most organizations concerned with the welfare of the blind make prevention one of their outstanding functions. Hitherto prevention of blindness has been largely engaged in as a private undertaking, but signs are not lacking that it will become more and more a public activity.

Of much significance was the organization in 1930 of the Committee on Statistics of the Blind, fostered by the American Foundation for the Blind and the National Society for the Prevention of Blindness, for the purpose of securing fuller and more accurate statistics upon the subject.

HARRY BEST, Ph.D.
Lexington, Ky.

Don't Abuse Your Eyes!*

Children take their eyesight for granted. It came along with them like their teeth and their hair and their arms and their legs. Every member of the body is precious, but if one had to be preferred to any other, eyes would come first. To be able to see is to have dominion over a large part of one's heritage, and to lose that power, even to a degree, is tragic, irremediable loss.

Eyes are sensitive where teeth and hair and arms and legs are resistant and tough. You can get false hair and false teeth, and an imitation of an arm, or of a leg, and manage, but there is no substitute for an eye. It is better to guard well the one you have, knowing that there can never be another.

Children do not know this. They give no thought to their eyes nor to their vision. They cannot be expected to understand the care that modern living makes imperative if eyes are to last their full time of usefulness. Children know nothing of the effects of eyestrain, of the dangers of poor light, bad print, dirty towels, dirty hands, or rough usage in relation to their eyes. But grown people know, and it is their duty to teach and to keep on teaching children the care of their eyes.

When a child has frequent headaches, loses interest in school lessons or indicates a dislike for books, have his vision tested by an expert. If glasses are ordered, get them and insist that the child wear them as directed. Inform the teacher about this and ask her co-operation so that the child will not wear his glasses in his pocket. Many a case of poor eyesight in maturity could have been prevented by the use of glasses in school days.

Insist that children read under a good light or not at all. They will read by the fading light of evening

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until the black shadows lie on their books. Eyes are so accommodating to the situation imposed upon them that it is not until it is too late that we discover they have done their utmost and can do no more forever.

Rubbing eyes with dirty hands and using dirty towels are other ways of causing eye trouble. Teach little children about this. Make it their habit to keep their hands away from their faces, particularly their eyes, and make it habitual for them to use only their own clean towels.

Eyesight is so precious that those who have it in perfection ought to treasure it beyond all other physical endowments and guard it as such. Once it is gone it is gone forever. Regrets and tears and bitterness of spirit are the price of carelessness.

ANGELO PATRI
New York, N. Y.

Communications

Anti-Fireworks Campaign in Cincinnati, Ohio

Prior to July 4, 1935, fireworks hazards had been a constant menace in Cincinnati and its vicinity. The use of fireworks became such an integral part of Fourth-of-July celebration that a large branch of a fireworks factory was established just outside of the city limits. In the later years before 1935, there was usually bedlam for about three days instead of one. The annual toll of injuries for the eight years preceding 1935 averaged 200 in the city hospital. This meant that only the severe 200 free cases were listed and an unknown, much greater number were treated privately. My records of private cases showed an annual average of five persons with ocular injuries directly due to exploding fireworks.

On July 4, 1935, an unusual number of ocular injuries were seen at the city hospital and in private practice. One handsome lad of 10 years had received a laceration through the entire diameter of the cornea and ciliary body with a collapsed globe. His lids were terribly lacerated. His mother, in the eighth month of pregnancy, was completely prostrated, the father was beside himself, and the combination made a very tragic scene. It developed that the boy himself was not using the fireworks, but that a can filled with dirt and powder had been carried through the air by the explosion of the powder, striking this boy in the face and mutilating his eye. There were several other lost eyes that day, and the sum of the experiences was so shocking that a most bitter resentment was roused against such a useless and vicious practice. The following day the city safety director was interviewed. He was shown the list of injured and the unretouched photographs of the three individuals with lost eyes, and within one-half hour an ordinance was being pre-

pared in the city solicitor's office. The president of the Cincinnati Academy of Medicine was asked for support, and he immediately asked and received permission from all the members of the Academy Council to support an anti-fireworks law. The newspapers, for the most part, supported the movement. The city council, being composed of only nine members, was quickly enlisted and when the law committee of the council met to consider recommendation of the law for passage, various presidents of mothers' clubs and two of the little patients were present for the hearing. The atmosphere thus created was almost irresistible and, in spite of attempts to soften the ordinance, the following iron-clad law was passed:

Section 1. That the Code of Ordinances of the City of Cincinnati be supplemented by adopting Sections 561, 561–1, 561–2, 561–3, and 561–4.

Sec. 561. The term "fireworks" as used in this ordinance shall mean all rockets, roman candles, bombs, balloons, wheels and other substances and devices for pyrotechnic display; all firecrackers, blank cartridges, torpedoes and concussion canes, pistols and other devices for the explosion of caps or cartridges, or any substance designed or intended to produce a visible or audible pyrotechnic effect by combustion, explosion, deflagration or detonation, except sparklers, blacksnakes, colored fires or flares and non-explosive novelties.

Sec. 561–1. It shall be unlawful for any person, firm or corporation to offer for sale at retail or to sell at retail, to loan, barter, deliver or give away within the City of Cincinnati any fireworks as defined in Sec. 561, except to holders of permits as provided in Sec. 561–3.

Sec. 561–2. It shall be unlawful for any person, firm or corporation to purchase at retail, use, fire, set off, discharge, set in motion or to ignite within the limits of the City of Cincinnati any fireworks as described in Sec. 561, except as provided in Sec. 561–3.

Sec. 561–3. Special permission may be granted to persons, firms or corporations for the purchase of fireworks as described in Sec. 561 and their use at a public gathering, provided an application is filed with the city manager setting forth the name of the applicant, the time and the place of the exhibition. The city manager on being satisfied that the applicant will use the fireworks in a public exhibition, and being satisfied that all reasonable precautions will be exercised with regard to the protection of the lives and property of all persons, may issue a permit which shall permit the use of fireworks at the time and place set out in the application.

Sec. 561–4. Any person, firm or corporation violating any of the provisions of Sections 561–1 and/or 561–2 shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be fined not more than one hundred dollars ($100.00) for each offense.

On July 4, 1936, the contrast was unbelievable. Instead of the usual din, there were picnics, parades and celebrations at amusement parks. Night displays of fireworks were

operated in the parks by adult employees holding permits. In this way, the haphazard handling of dangerous explosives in casual hands was completely eliminated. Instead of the usual casualties listed, there was no case of fireworks injury received at the city hospital and there were only two minor burns reported in the entire city. These were suffered by two young men who had purchased gunpowder at a firearms store. It was obvious that a well-regulated law can be most effective in curbing the useless maiming of individuals by fireworks.

ALBERT L. BROWN, M.D.
Cincinnati, Ohio

Cataract with Acute Secondary Glaucoma Following the Use of Dinitrophenol*

During the past year about 40 cases of cataract have been observed following the use of dinitrophenol for weight reduction. Alpha-dinitrophenol is a yellow, crystalline powder, soluble in alcohol and in ether. It is a dye closely related to trinitrophenol, or picric acid, is a catabolic stimulant and produces pyrexia, or sweating, but no change in the blood pressure and pulse rate. During the World War the French physicians observed cases of poisoning by dinitrophenol in munition factories.

* Report of two cases presented before the ophthalmologic section of the New York Academy of Medicine, May 18, 1936.

Using experimental animals, the increase in metabolism with oral doses of from 5 to 10 milligrams per kilogram weight is about 50 per cent; with higher doses the animals produce heat so fast that they may die from hyperpyrexia. The stimulation of the metabolic rate, according to Cutting and Tainter, is peripheral and is due to an increase of oxygen consumption in the tissues; it is independent of nervous and glandular action. The French workers observed in the experimental animals a marked increase of the carbohydrate content of the body, particularly that of liver glycogen, and a corresponding rise in the blood sugar, so that they believed that the excess metabolism was at the expense of carbohydrates.

Gruber also speaks of the glycogenolytic action of dinitrophenol. Its use for weight reduction has been extensive in this country only for the past three or four years. Tainter and Cutting reported that, in 1934, 1,200,000 capsules of the drug were given to about 4,500 patients in the Stanford Clinic of San Francisco. They stated that at least 100,000 people were treated with dinitrophenol in this country during the same year. The average time which elapses between first taking the drug and the appearance of cataract is from five to fifteen months. It is because of this delayed effect that reports of dinitrophenol cataract appeared only during the past year. We certainly

may expect many more cases of cataract in the near future. There seems to be an individual susceptibility to the development of cataract, as the number of dinitrophenol cataracts is comparatively small in proportion to the number of obese patients treated with the drug. All patients reported took the drug within the recommended therapeutic doses and, in nearly all, the lens changes progressed rapidly, so that within a few weeks, vision was reduced to hand movements. All cataracts seemed to have a characteristic morphology. With one exception, all reported cases were women, and the age varied from 25 to 50 years.

Our two cases differ from the others reported in the literature by complication of the cataract with acute secondary glaucoma. Only two other similar cases were reported—by Shutes. In view of the rapidity of swelling of the lens, it is rather surprising that no more cases of glaucoma were reported in this type of cataract.

Case Reports

A female, aged 42, presented herself on September 5, 1935, with acute glaucoma of the left eye. Both lenses were cataractous; soft, flocculent precipitates throughout the cortex and clear intervals between the opacities, like a splitting between fibers, were made out on slit-lamp examination. Vision of the left eye was reduced to hand movements and that of the right to 6/200. An iridectomy was done on the left eye for reduction of the tension. Six days later the patient was seized with a glaucomatous attack of the right eye because of the rapid swelling of the lens, and an iridectomy was performed on this eye also. In two months a cataract extraction was performed on each eye with an interval of two weeks. The vision of both eyes was restored to normal with correction. The amount of dinitrophenol ingested during nine months was 54 grams and the total loss of weight was 49 pounds.

A female, aged 38, consulted Dr. Berens because of pain and poor vision in the right eye. The intraocular tension was high in the right eye and the lens was swollen and opaque. An iridectomy was performed on the right eye and 15 days later one on the left eye. A cataract developed within a short period on the left eye too. Cataract extraction was done on both eyes with an interval of three months. The patient received a total amount of 125 grams of dinitrophenol during a period of eleven months.

OLGA SITCHEVSKA, M.D.
New York, N. Y.

The Need of Large Print Books in Residential Schools for the Blind

The book, *Everyday Manners*, brought up in our minds the possibility of having our present braille textbooks paralleled with large print type books. Beyond the sixth grade very little is available in large ink type. At the Minnesota School for the Blind nearly one-half of the

student body is in the sight conservation department. The lack of large print text books in the upper grades and in the high school makes the use of braille increasingly necessary. We feel that this is a handicap because it slows up the reading speed of sight-saving class girls and boys. It is a well-known fact, furthermore, that children who can use their eyes safely, even though they are defective, will not rely on braille after leaving a school for the blind. The present law as it is drawn up and as it covers the Federal appropriation for text books for the blind may possibly need amending. At any rate, we feel that the usefulness of the American Printing House will be tremendously increased if it can be permitted to print large-type books.

A lack of large-type books penalizes unduly the semi-sighted child. The totally blind children, of course, depend on their braille; the child with normal vision has a world of reading material at his command. The semi-sighted child, however, must use either braille or small print, neither of which is suitable.

Residential schools "for the blind" are going to need an increasing number of large-type books. We in Minnesota are anxious to parallel our present braille texts with 18- to 24-point ink print books as soon as possible.

J. C. LYSEN
Faribault, Minn.

Winifred Hathaway

"To WINIFRED HATHAWAY, whose inspired service in behalf of sight-saving classes for visually handicapped children has made her another LADY WITH A LAMP."

Inscription on Leslie Dana Gold Medal, 1937.

Note and Comment

Leslie Dana Award to Winifred Hathaway.—Readers of the REVIEW will join in the jubilance of every worker for prevention of blindness at the award of the Leslie Dana Gold Medal to Mrs. Winifred Hathaway, associate director of the National Society for the Prevention of Blindness. Mrs. Hathaway was selected for this honor by the St. Louis Society for the Blind, through which the medal is offered by Mr. Leslie Dana of St. Louis.

This highly prized token of recognition in the field of public health was given to Mrs. Hathaway at a luncheon meeting of the Association for Research in Ophthalmology, in Atlantic City, Tuesday, June 8, during the convention of the American Medical Association. The presentation address was made by Dr. Park Lewis, who was awarded the Leslie Dana Medal in 1928.

Mrs. Hathaway is the second woman to be accorded this honor. In 1926, it was conferred upon the late Miss Louisa Lee Schuyler, of New York City, who was chiefly responsible, with Dr. Park Lewis, for the founding in 1908 of the National Society for the Prevention of Blindness. Last year, the medal was presented to Dr. John M. Wheeler, Professor of Ophthalmology in the Medical School of Columbia University and Director of the Eye Institute at the Columbia-Presbyterian Medical Center in New York.

The inscription on the medal this year reads: "To WINIFRED HATHAWAY, whose inspired service in behalf of sight-saving classes for visually handicapped children has made her another LADY WITH A LAMP."

Mrs. Hathaway has achieved an international reputation through her many years of service in the campaign to save eyesight, especially for her work in promoting the establishment of sight-saving classes in which children with seriously defective vision receive a normal education with a minimum of eye-strain. Largely through her personal inspiration and encouragement, there are now 525 such classes in 168 communities throughout the United States.

She has probably brought the story of the need and the methods of safeguarding sight to a larger number of persons than any other man or woman in America.

Survey of the Eyes of 1,000 Commercial Drivers.—Dr. Edwin H. Silver discusses, in the *Journal* of the American Optometric Association, Dr. Alvhh R. Lauer's research on the relationship of visual acuity to safety. Dr. Lauer examined more than 1,000 commercial drivers employed in five states. The summary of the findings indicates that 43 per cent of these drivers do have accidents and 57 per cent do not. Visual acuity of at least 40 per cent as measured on the Clason instrument is necessary for the safe driving of commercial vehicles and 60 per cent or over is desirable for greatest safety. According to the study, there is no marked relationship between color blindness and accidents. High accident liability seems to be associated with the narrowed field of vision. Drivers having this defect are of two kinds—compensators and non-compensators. The former have no difficulty but the latter are bad risks. Because of the fact that the better eye and the dominant eye are not always the same, differences in acuity between the two eyes do not seem to be correlated with accident proneness. Astigmatism scarcely seems to be a factor in safe driving.

The *Journal* contains the full report of the research of the American Optometric Association, and presents not only the above facts but also an outline of the analysis of the study; consideration of results, together with a series of graphs showing the relationship between acuity and performance; the relationship between acuity and other conditions; the relationship between accidents and visual conditions; the relationship between astigmatism, accidents and performance; and the relationship between phorias and accidents.

Effect of High Altitude on Color Vision.—A recent issue of the *Optician* (London) publishes the following interesting item on the relationship of high altitudes to color vision:

"In order to investigate the effects of reduced barometric pressure on vision a German investigator has made use of a pressure chamber in which barometric pressures corresponding to sea-level, 3,000, 5,000 and 6,000 meters of altitude, could be obtained. His subjects all had normal color vision under ordinary pressure and, although some did not appear to be affected by reduced pressures, a greater number showed a considerable reduction in their discrimination for colors and brightness. A person with normal color

vision could be temporarily rendered an anomalous trichromat under reduced pressures, while an anomalous trichromat could be changed to a dichromat.

"These investigations are of interest as they point to the possibility of an airman being rendered dangerously color blind during a flight."

Blindness Caused by Mustard Gas.—Added evidences of the endlessness of war ravages are manifesting themselves in the appearance during the past three years of many cases of "delayed-action" blindness caused by exposure to mustard gas in the World War. According to a recent issue of the *Medical World*, the first sufferers were noted three years ago. Thus far 24 cases are recorded.

World Federation of Education Association Meeting.—Miss Fumiko Fukuoka, who completed her work as a scholarship student of the National Society for the Prevention of Blindness, will speak on "The Eye Health of School Children," before the health section at the meeting of the World Federation of Education Association to be held in Tokio, Japan, August 2 to 7, 1937. Miss Fukuoka, upon her return to Tokio this summer, will join the medical social service staff of St. Luke's International Medical Center.

How We See Moving Pictures.—Why moving pictures appear to us to be pictures in motion rather than the rapid succession of still pictures they really are is explained by recent work from the Columbia University biophysics laboratories. Dr. Selig Hecht, chief of the department, is well known for his studies on how we see, particularly for his researches into how the bleaching by light of a dye called visual purple, the sensitive material of the eye, results in vision. In a talk delivered to the biologists at Rutgers University he recounted a series of researches on why a light turned on and off fast enough appears to be uninterrupted. Light bleaches the dye which the eye regenerates. In darkness a larger amount of it is built up than in light. It is this which makes us more sensitive to light after being in the dark. When a light flickers fast enough, as is the case when we see motion pictures, not enough visual purple is built up for the eye to become specially sensitive to the following flash of light; hence, no flicker is per-

ceived. But when the light flickers more slowly, as for instance at the fifty-times-a-second of the electric light bulbs in the New York subways, enough visual purple is rebuilt in the dark periods to permit the eye to realize that there is a flicker.

Paint Colors Have Light Reflecting Values.—The Bergen County Federation of Boards of Education, in a recent issue of their *School Bulletin*, pointed out the importance of clean and light-colored surfaces, particularly of ceilings and upper walls, as a part of the lighting system in schools. Light colors are important reflectors of daylight and artificial light and it is therefore important for every school administrator to study the light-reflecting qualities of individual classrooms in order that each child may have a better opportunity to conserve his vision. Dull, flat paints should be used in order to avoid glare. The following table shows the comparative reflection values of paint colors:

Color	*Per Cent*	*Color*	*Per Cent*
White	89	Buff	63
Ivory	82	Pale Green	59
Canary Yellow	77	Shell Pink	55
Cream	77	Bright Sage	52
Caen Stone	76	Silver Gray	46
Orchid	67	Olive Tan	43
Cream Gray	66	Forest Green	22
Ivory Tan	66	Coconut Brown	16
Sky Blue	65	Black	2

Sight-Saving Classes in the U.S.S.R.—In 1932 the Institute of Children's Health in Leningrad addressed a request to the National Society for the Prevention of Blindness for information regarding the materials which should be used in classes for children with poor vision, as well as information about the organization of sight-saving classes and about occupations which are suitable for partially seeing young people. This year the Society was pleased to hear again from the Institute to the effect that 20 classes have been established in Leningrad and that the work is going forward effectively with the strong approval and help of the government.

National Society Notes.—Lewis H. Carris, managing director, visited five states and took a brief trip into Canada during the past three months. In Washington, D. C., he attended a

meeting of the committee on conservation of vision of the State and Provincial Health Authorities and attended a hearing on Bill 1634 concerning the education of the physically handicapped. He also attended a hearing several weeks later, in Harrisburg, Pa., before the state legislature there regarding an appropriation for the prevention of blindness program of the Pennsylvania Association for the Blind. After his trip to Washington, Mr. Carris went to Chicago, where he conferred with the Illinois Society for Prevention of Blindness. In Portland, Me., he spoke at a Rotary Club luncheon, before the board of directors of the Cumberland County Public Health Association, and to a group of school principals, special teachers, nurses and physicians, on the subject of the responsibility of schools in the conservation of vision. In Columbus, Ohio, he attended the celebration of the one-hundredth anniversary of the founding of the Ohio State School for the Blind. "How May We Better Inform Physicians and Educators of the Importance of Conservation of Vision Classes?" is the subject of his talk at the annual conference of the American Association of Workers for the Blind, meeting in Toronto, Ontario.

Mrs. Winifred Hathaway, associate director, addressed three groups—the Parent-Teachers Association of Fort Lee, N. J.; the League of Women Voters of Pelham Manor, N. Y., at the invitation of the chairman of their child welfare committee; and members of the regional conference of Girl Scouts, Inc., at a round-table gathering on "The Girl Scout with a Physical Handicap."

Mrs. Eleanor Brown Merrill, associate director, conferred with the State and Provincial Health Authorities in Washington, D. C., and attended a meeting there of the Inter-organization Committee on Eye Hygiene, for the purpose of discussing the proposed demonstration of a prevention of blindness program. In connection with this program she also met with members of the Maryland Society for Prevention of Blindness. During the last week in May Mrs. Merrill attended the National Conference of Social Work in Indianapolis, Ind., where the National Society had an exhibit. She addressed the Public Health Nursing Association of Indianapolis and conducted a luncheon meeting of the Committee of Medical Social Eye Workers. In Wilkes-Barre, she spoke under the auspices of the Pennsylvania Association for the Blind.

In order to obtain records of children enrolled in the Maryland School for the Blind, C. Edith Kerby, statistician, made a trip to Baltimore, Md. Dr. Anette M. Phelan, associate in education, continuing her extended field trip throughout the West, has visited the following colleges and universities: the state teachers colleges of Fresno, Calif., Greeley, Colo., St. Cloud, Minn., and Billings, Mont.; Eastern Montana Normal School, Billings; Cornell University, Saratoga, N. Y.; and the University of Washington, Seattle.

The Institute on Eye Hygiene, conducted by the Society's associate for nursing activities, Mrs. Francia Baird Crocker, and supervised by Dr. Willis S. Knighton of New York City, was completed with great success. Representatives from the following agencies attended the meetings: Society for Prevention of Blindness, Washington, D. C.; State Department of Health, Minneapolis, Minn.; Department of Education, Albuquerque, N. M.; Eyesight Conservation Committee, Brooklyn Health Council, Brooklyn, N. Y.; Public Health Nursing Association, Pittsburgh, Pa.; Vermont Department of Public Welfare, St. Albans, Vt.; Washington Department of Social Security, Division for the Blind and Prevention of Blindness, Olympia, Wash. Fifteen other agencies sent representatives to special lectures, and the aggregate attendance for the month was 996.

Current Articles of Interest

Studies on the Infectivity of Trachoma: IV. On the Bacteria Cultivable from Trachoma and Clinically Similar Conditions, R. W. Harrison, Ph.D., and L. A. Julianelle, Ph.D., *American Journal of Ophthalmology*, February, 1936, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. A study was made of the bacteria cultivable from trachoma and clinically similar diseases as well as from normal eyes. It was found that the bacteria cultivable from trachoma are not typical of that infection since they are also recoverable in approximately similar frequency for other conditions of the eye. While less numerous, the same bacteria may be isolated from the eyes of normal individuals. The bacterial flora of trachoma does not vary with the different clinical stages of the disease nor with the presence of epithelial-cell inclusions. Inoculation into susceptible monkeys of all the different varieties of cultures isolated, either individually or pooled, does not induce experimental trachoma even though the tissues from which the bacteria are derived are demonstrably infectious. The observations made in the study furnish no evidence, therefore, that any of the bacteria cultivable from trachoma induce the experimental disease in monkeys.

Allergy of the Eye, Ear, Nose and Throat, Leon Unger, M.D., *Illinois Medical Journal*, January, 1937, published monthly by The Medical Profession of Illinois, Oak Park, Ill. The author lists the following conclusions: (1) The eyes and the upper respiratory tract are especially prone to the disturbance of hypersensitivity; (2) early recognition of possible allergy of the eye may prevent corneal ulcers and subsequent opacities; (3) Ménière's disease is probably allergic; (4) the study of nasal secretions in nasal cases should be routine. A high percentage of eosinophiles indicates allergy, and treatment in such cases should be from both rhinological and allergic points of view; (5) the best treatment for hay fever is a series of injections of the appropriate pollen extracts; (6) the value of nasal ionization is still under dispute; its results

in pollen hay fever usually are not good; in vasomotor rhinitis some workers report considerable success.

Congenital Syphilis of the Eye: A Clinical Study, V. E. Lennarson, M.D., and P. C. Jeans, M.D., *American Journal of Syphilis, Gonorrhea and Venereal Diseases*, January, 1937, published monthly by The C. V. Mosby Company, St. Louis, Mo. The records of a group of 247 syphilitic infants and children are reviewed with special reference to syphilitic lesions of the eye and to the relation of these lesions to the Wassermann reactions in the blood and cerebrospinal fluid.

Special examinations of the eyes were made in 58 per cent of the patients. It was found that of the entire group 38 per cent, and of those who had special examinations 66 per cent, have eye lesions attributable to syphilis.

The incidence of keratitis among all the children over two years of age was 43 per cent, with a maximum frequency of 57 per cent at eight years.

Chorioretinitis was found in only one infant. It was present in 6 per cent of the entire group of older children and in 13 per cent of those whose fundi were examined.

Optic atrophy was present in one infant. It was found in 4 per cent of the entire group of older children and in nearly 6 per cent of those whose fundi were examined.

Among the children two years of age and over, the Wassermann reaction of the cerebrospinal fluid was positive in an equal proportion of those with and those without syphilis of the eye. Among the patients with keratitis, the cerebrospinal fluid was positive with definitely less frequency than among the group as a whole.

The Development of Modern Methods of Estimating Refraction, W. B. E. McCrea, M.B., B.Ch., D.O.M.S., *The British Journal of Ophthalmology*, March, 1937, published monthly by Geo. Pulman & Sons, Ltd., London, England. The story of the growth of refraction is told up to 1870. "The use of lenses for the correction of refractive errors," states the author, "is of great antiquity, but it is only within the last hundred years that any real progress towards the exact correction of ametropia can be said to have taken

place." The article, therefore, deals chiefly with the research and work of the ophthalmologists of the nineteenth century.

A Study of 288 Patients Examined with the Ophthalmo-Eikonometer, Conrad Berens, M.D., *The British Journal of Ophthalmology*, March, 1937, published monthly by Geo. Pulman & Sons, Ltd., London, England. A study of 288 patients revealed no apparent significance in the age or sex of the patients for whom iseikonic lenses were prescribed. However, the percentage of females was slightly higher than the percentage of males. The ages of the majority of the patients ranged from 25 to 40.

Apparently, it is concluded, there are no pathognomonic symptoms which are complained of by patients with aniseikonia or which seem to be relieved by wearing iseikonic correction. The most typical symptoms which seem to be relieved are asthenopia and headaches, especially when these symptoms are aggravated by reading.

In this series of cases, there seemed to be a tendency for the smaller image to be in the right eye and for the differences to be found more frequently in the horizontal than in the vertical meridian.

Apparently, there was definite relief of symptoms in 68.7 per cent of the 160 patients who wore iseikonic lenses, and half of those who reported improvement of symptoms had marked or nearly complete relief.

At present it is impossible to determine whether the factor which is measured with the ophthalmo-eikonometer and corrected by iseikonic lenses is aniseikonia alone.

The author concludes with the statement that much scientific research and many hundreds of clinical experiments with careful statistical analyses must be carried out before the exact place of aniseikonia in causing ocular symptoms can be conclusively evaluated.

The Results of Corneal Transplantation, J. W. Tudor Thomas, D.Sc., M.D., M.S., F.R.C.S., *British Medical Journal*, January 16, 1937, published weekly by the British Medical Association, London, England. An account of the results of corneal transplanta-

tion as carried out by ophthalmic surgeons in recent years is given. The author "feels justified by the results quoted in stating that in suitable cases corneal transplantation has now ceased to be an experiment and is a practical procedure. . . . . The future," he is convinced, "will bring still better chances of success for the suitable cases, and there is some justification for the view that, with a continuance of earnest effort, it will become possible to do a great deal more for many of those cases now classified as unfavourable."

Importance of Aniseikonia, Edward Jackson, M.D., *American Journal of Ophthalmology*, January, 1937, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. The really important facts brought out by recent investigations of aniseikonia, says Dr. Jackson, are these:

Correcting glasses placed before the eyes change the sizes and forms of retinal images. Such changes require changes in cerebral associations of the visual process. Such a process of physiologic adaptation is necessary with each important change in correcting glasses. Our patients should be warned that such disturbances of vision may result; that time should be allowed to effect the change of cerebral associations before they expect full service from the new association of eyes and glasses; that "getting used to glasses" is a real and necessary process, important enough to justify giving it the necessary time and attention; and that the prescribing and selling of glasses are of service to the patient only when the physiologic adaptation to them has been secured.

Surgical Results in 223 Cases of Heterotropia: Especial Reference to Orthoptic Training, Conrad Berens, M.D., *American Journal of Ophthalmology*, March, 1937, published monthly by the Ophthalmic Publishing Company, St. Louis, Mo. The author draws the following conclusions:

1. Of 49 patients (Group I) with varying degrees of esotropia and exotropia, some of whom had alternating strabismus and who received no orthoptic training preoperatively or postoperatively, only 6 per cent became heterophoric postoperatively. Heterotropia persisted in 94 per cent of the patients.

2. Of 85 patients (Group II) with varying degrees of esotropia and exotropia, some of whom had alternating strabismus and who were given orthoptic training postoperatively, heterophoria was present in 32 per cent (some degree of binocular vision was found in 61 per cent).

3. Of 89 patients (Group III) with varying degrees of esotropia and exotropia, some of whom had alternating strabismus and who received preoperative and postoperative orthoptic training, heterophoria was present in 49 per cent (73 per cent had some degree of binocular vision).

4. By combining Groups II and III, it is evident that heterophoria following surgery and orthoptic training was present in 70 patients (40 per cent); heterophoria for distance or near in 11 patients (7 per cent); heterotropia persisted in 84 patients (48 per cent); and there was no record of whether heterophoria or heterotropia was present in 9 patients (5 per cent).

5. Forty-seven (70 per cent) of 67 patients with alternating esotropia or exotropia developed some degree of binocular vision.

Twenty-nine (75 per cent) of 39 patients who developed alternating squint between the ages of one and four years had some degree of binocular vision following treatment. Prior to operation only 12 patients were known to have had some degree of binocular vision.

Seven of 8 patients who had strabismus before the age of one year developed some degree of binocular vision.

6. That orthoptic training may be important in the development of normal retinal correspondence postoperatively is suggested by the fact that 25 per cent of 126 patients with heterotropia had false projection and following orthoptic training the number was reduced to 10 per cent.

7. Correction of aniseikonia seemed to be a factor in aiding fusion in two of six patients with alternating esotropia.

8. Of 85 patients with amblyopia, improvement in vision apparently occurred in 53 eyes (62 per cent).

Requirements of Good Desk Lighting, C. E. Ferree, Ph.D., and G. Rand, Ph.D., *American Journal of Ophthalmology*, March, 1937, published monthly by the Ophthalmic Publishing Company,

St. Louis, Mo. The following features are presented as being necessary for a satisfactory desk lamp:

1. Adequate intensity of light should be provided, also a means for varying intensity to suit individual needs and different types of work without changing the color and composition of the light or the size, shape or location of the illuminated area.

2. The unit itself should be glareless when used with lamps of either low or high wattage.

3. It should be placed at a sufficient height to give a wide field of illumination. This spread of light can be increased by certain provisions in the construction of the unit, such as are described.

4. The light should be well diffused and evenly distributed on the plane of work and there should be a well-balanced placement of light and brightness in the field of view. For securing this latter condition, an upward component of light is an important factor in addition to the complete elimination of glare from the lighting unit itself.

5. Glare on the work should be reduced to a minimum. Diffusion of light and height of unit above the plane of work are important factors in securing this result. The most effective means for eliminating glare on the work, however, is a suitable provision for varying the placement of light.

6. The light should be made to approximate daylight in color and composition. For many eyes, particularly in certain pathologic conditions, this is almost imperative.

The Glaucoma Clinic of the Herman Knapp Memorial Eye Hospital, Mark J. Schoenberg, M.D., and Benjamin Esterman, M.D., *Archives of Ophthalmology*, April, 1937, published monthly by the American Medical Association, Chicago, Ill. The authors state that their one year's experience with the glaucoma clinic of the Herman Knapp Memorial Eye Hospital has taught them that such a clinic is fulfilling an urgent need, that it is in step with the spirit of modern clinical medicine, that it is bound to serve the best interest of the patients and of the community by preventing blindness whenever possible and that it offers opportunities for research unequaled by the average ophthalmic clinic.

It is their firm belief that progress is possible if the problem of

glaucoma is attacked by: a systematic and intensive medical as well as ophthalmologic study of each patient with glaucoma; making a thorough survey of the glaucoma material in the ophthalmic institutions of the metropolitan area; establishing a glaucoma clinic in each ophthalmic institution; organizing an association of glaucoma clinics.

Examination and Care of the Eye in Relation to Lighting, C. E. Ferree, Ph.D., and G. Rand, Ph.D., *Archives of Ophthalmology*, January, 1937, published monthly by the American Medical Association, Chicago, Ill. In summarizing their article the authors point out that in comparison with other branches of medicine the development and use of hygienic measures in the care and treatment of the eye seem to have suffered retardation. Like any other organ of the body, the eye, if it is to remain healthy or to cure itself of any of its ills, congenital or acquired, must first be put into a situation calling only for the healthy exercise of its normal functions. Important factors in this situation are the conditions under which it is ordinarily called on to work, two important aspects of which are the type of work and its illumination. Of these aspects, the latter is the more amenable to variation and control. They believe that the prescribing of light to meet the requirements of the individual person has become a practical possibility, and that when properly used it will be of significant service in the care and treatment of the eye. The need for it is acute in the case of many of the patients who come under the physician's care. They point out that this is a new division of the subject of lighting which has been created and which belongs in its narrower and more technical aspects to the medical profession and in its broader and more general aspects to the welfare and personnel worker.

Prognosis of Postoperative Sympathetic Ophthalmia: A Statistical Study, Harold H. Joy, M.D., *Archives of Ophthalmology*, April, 1937, published monthly by the American Medical Association, Chicago, Ill. This study, based on 103 cases of postoperative sympathetic ophthalmia, brings out several points worthy of notice. The final visual results indicate that the prognosis of postoperative

sympathetic ophthalmia is not necessarily as unfavorable as many authors have stated, provided proper treatment is instituted with promptness. The final outcome in the cases in which the condition followed combined extraction of senile cataract was less favorable than in those in which it followed other intraocular operations. The inflammation in the sympathizing eye was disproportionately more severe than that in the exciting eye in three cases of sympathetic ophthalmia due to extraction of cataract in which the diagnosis was confirmed and three cases of the same kind in which the condition was clinically diagnosed. However, this was not apparent in 12 cases in which the condition was clinically diagnosed in which neither eye was enucleated. There is no indication that sympathetic ophthalmia due to iridectomy for glaucoma is particularly rare or that its course is mild. The results in the few instances in which secondary operations were performed indicate that the exciting eye tolerates surgical intervention well and that the sympathizing eye can often be safely operated on if it is properly prepared for the intervention.

Book Reviews

TRACHOMA. A. F. MacCallan, C.B.E., M.D., F.R.C.S. London: Butterworth and Co., 1936. 225 p. Ill.

The author is one of the most prominent authorities in the field—president of the International Organization against Trachoma; consulting surgeon to the London Royal Eye Hospital and other institutions, and formerly director of ophthalmic hospitals of the Egyptian Government. His work in Egypt—"the cradle of trachoma"—added to MacCallan's well-deserved fame. He advised the Government and planned the ophthalmic hospitals from 1900 to 1923, so that in 1934 somewhat less than a million new patients were received in them. The splendid Memorial Ophthalmic Laboratory at Giza, now so ably directed by Dr. R. P. Wilson, is said to owe its existence to MacCallan.

The treatise comprises reviews of the history, causation, epidemiology, pathology, clinical course and treatment of trachoma. Apart from this and more important is the fact that his personal observations, especially derived from experiences in Egypt and in England, are threaded through the volume. The book is therefore of value to the ophthalmologist and to those interested in the prevention of blindness, for this disease is a major cause of blindness in trachomatized countries.

The historical section deals mainly with the origin and spread of trachoma in Egypt. It is noteworthy that MacCallan believes that the disease arose among the nomad races of Mongolian plains and spread West with Mongol invasions until it reached the Mediterranean littoral, where it was most widely disseminated. Eastward it traveled through China and Siberia and reached, through migrations, the American continent, where it infected the American Indians.

In the section on etiology, the different theories and experimental evidence are brought into view, especially the recent work of Thygeson on an ultramicroscopic virus as the causal factor. The work of Julianelle, of Washington University, in this connection is, however, omitted. The chapters on clinical appearance and

diagnosis are complete, with stress being laid on the four clinical stages of the disease (the well-known MacCallan's classification). The writer maintains the local character of this affection and the fact that in trachomatized countries it is an infantile disease (infection occurring almost always before the age of two years). The use of the slit lamp and biomicroscope for diagnosis is advised. The complications and sequelae of trachoma and its differential diagnosis are described in full.

MacCallan expresses his debt to Dr. Pulvertaft for histopathological details, and emphasis is laid on the early, generalized, subepithelial lymphocytic invasion and the fact that the follicle may then be absent. Of interest in the epidemiological section is the description of the geographical distribution of trachoma. Treatment is considered both from the points of view of prevention (personal, familial, institutional—schools—naval and military, national and international) and of alleviation of symptoms of the disease and its complications by medical and surgical procedures.

PETER K. OLITSKY, M.D.

STRABISMUS. A. Cantonnet, M.D., and J. Filliozat, M.D. London: M. Wiseman and Co., Ltd., 1936. 329 p.

This well-bound and legible book by two French authors concerns itself with the re-education of binocular vision in strabismus. It should be studied carefully by every honest student for it will give pause to the skeptics of orthoptic training. Chronic operators will find little comfort in the ideas presented. The authors feel that in strabismus "it is more elegant to untie the Gordian knot than to sever it; we must obviously sever it if it cannot be untied, but it must be untied if this is possible."

The book is divided into three parts. Part I discusses the physiology of binocular vision and includes many tests for the measurement of binocular vision and stereoscopic vision; Part II discusses the pathology of binocular vision; and Part III, which may be considered the main reason for the book, develops the re-education of squinters according to the authors' ideas. The reader will undoubtedly disagree with many of the tenets of the authors but he cannot fail to be impressed with the thoroughness and care of the presentation. The question of strabismus and its

non-operative treatment is a moot one and this book should be on the "must" list of every serious worker.

WILLIS S. KNIGHTON, M.D.

AIDS TO OPHTHALMOLOGY. N. Bishop Harman, F.R.C.S. Eng. Baltimore: Wm. Wood and Co., Eighth Edition, 1935. 242 p. Ill.

This book by a well-known English author contains excellent material for the doctor who wants his ophthalmology in brief. The fact that it has run through eight editions attests to its popularity. All phases of eye work are touched upon, including bacteriology and operations. At the end of the book are tables for standards of vision of various English military and educational services. The book contains over two hundred pages of descriptive matter and line drawings. It is an excellent introduction to ophthalmology for the medical student but it should not be considered a complete textbook for an eye man. It is unfortunate that the type is so small as to be annoying.

WILLIS S. KNIGHTON, M.D.

THE EXTRA-OCULAR MUSCLES: A CLINICAL STUDY OF NORMAL AND ABNORMAL OCULAR MOTILITY. Luther C. Peter, A.M., M.D., Sc.D. Philadelphia: Lea & Febiger, 1936. 351 p. Ill.

This work bids fair to assume the proportions of a standard. Its popularity is certainly growing. The reviewer feels that this is due to the fact that the descriptions and arrangement render the work very understandable. The illustrations are particularly fine. They have been well selected from the literature, and original drawings and photographs make the work most appealing. The reviewer would like to see a somewhat broader discussion of current theories, the author having emphasized his own views and experiences somewhat at the expense of other generally accepted ideas.

We hope to have the pleasure of reviewing many editions of this work, as it is most deserving of a permanent place in ophthalmic literature.

JOHN N. EVANS, M.D.

WILLS HOSPITAL EYE MANUAL FOR NURSES. G. E. Cole. Philadelphia: W. B. Saunders Co., 1936. 202 p. Ill.

Primarily a text on ophthalmic nursing, this volume gives, in detail, nursing procedures in caring for eye patients.

The chapter on orthoptic training is very brief, only about seven pages, including several illustrations. While the subject is comparatively new for the nurse to consider, it is doubtful whether the chapter will be of very much use to public health nurses in helping them to understand which cases need training and the reasons for the procedures outlined.

Public health nurses who have had very little, if any, experience in caring for eye patients might find the book helpful in enlarging their vocabulary (there is a good glossary attached), and of use if an eye patient is to be taught how to follow the ophthalmologist's instructions in his home.

FRANCIA BAIRD CROCKER, R.N.

Briefer Comment

THE MANAGEMENT OF THE NEWBORN BABY: A GUIDE FOR MIDWIVES. Alan Moncrieff, M.D., F.R.C.P. London: Association of Maternity & Child Welfare Centres, 1936. 48 p. Ill.

This booklet, which can easily be carried in a pocket, gives detailed instructions in clear and simple language for each step in the care of the mother and newborn baby immediately before, as well as after, the birth of the child. The importance of instilling silver nitrate solution into the baby's eyes immediately after birth is stressed, and the detailed instructions are illustrative of the manner in which each step in the care of the mother and child is outlined.

PERKINS INSTITUTION AND MASSACHUSETTS SCHOOL FOR THE BLIND, ONE HUNDRED AND FIFTH ANNUAL REPORT, 1936. Watertown, Mass. 80 p. Ill.

The well co-ordinated report of Perkins Institution might have been entitled "Looking Ahead," since it stresses the expanding program of the Institution and the urgent and immediate needs which call for new facilities and new sources of income. Provision must be made for educating triply handicapped children—those who are deaf, blind and without the power of speech; facilities must be found for training blind mentally retarded children who are unable to pursue the present program satisfactorily; and it is hoped that income which is not designated for educational purposes may be made available to provide physical and psychiatric care, as well as to promote other projects.

YEARBOOK OF THE NEW YORK INSTITUTE FOR THE EDUCATION OF THE BLIND, 1936. New York, N. Y. 73 p. ill.

The illustrated 1936 Year Book of the New York Institute for the Education of the Blind is interesting and valuable not only for the reports of the board of managers and the principal, but for the general information which is given. The schedule of classes for the upper school and the program of the anniversary exercises help to create for the reader a mental picture of the life of the school.

THE MECHANISM OF ACCOMMODATION. Edgar F. Fincham, F.Inst.P. London: George Pulman & Sons, Ltd., *British Journal of Ophthalmology*, Monograph Supplement VIII, 1937. 80 p. Ill.

The author summarizes his points of evidence that accommodation is brought about by a reduction in the tension under which the lens is suspended, as follows:

1. The anatomy of the ciliary muscle points to the conclusion that its inner portion will act as a form of sphincter muscle, so that in contraction the ciliary corona from which the lens is suspended by the zonule will be reduced in diameter.

2. This conclusion is verified by the records of the movements of the inner edge of the ciliary body in a case of aniridia.

3. The lens is displaced in the direction of gravity during great efforts of accommodation; its position is not affected by gravity in the unaccommodated state.

4. In the case of the eye with the empty lens capsule, the difference between the tautness of the capsule in the unaccommodated state and its slackness during an effort of accommodation, can be accounted for only by the relaxation of the tension under which the capsule is held.

5. In the dissection of the eye of a child in which the lens was found to be in the unaccommodated form after the removal of the cornea and iris, the anterior surface of the lens assumed a form consistent with an accommodation of 14 diopters when the suspensions of the lens were severed.

ORGANIZED SAFETY BY ORGANIZED PARENTS AND TEACHERS: TRAFFIC SAFETY EDUCATION PROJECT OF THE NATIONAL CONGRESS OF PARENTS AND TEACHERS. New York: National Congress of Parents and Teachers, 1936. 16 p. Ill.

Assuming its responsibilities in the education of the public on the subject of organized safety by parents and teachers, the National

Congress of Parents and Teachers issued an attractive and arresting bulletin dealing with the following topics: the traffic problem; personal responsibility of the members for traffic safety; traffic problems of particular interest to parent-teacher members; parent-teacher co-operation in a school safety program; and traffic legislation of particular interest to parent-teacher members—the standard license law.

READING READINESS—A PROGNOSTIC STUDY. Wendell William Wright. Bloomington, Indiana: School of Education, Indiana University, Bulletin, Vol. XII, No. 3, 1936. 46 p.

Because studies of half-grade promotions made in the past few years have disclosed that in the schools of the United States with mid-year promotions 20 per cent of the pupils in the beginning first grade have had to repeat that half grade, a two-year prognostic study was undertaken, including approximately 400 beginning first grade pupils under normal classroom conditions in the Bloomington, Indiana, public schools. This careful study has been printed with a valuable bibliography and a list of bulletins in the field of education published by the School of Education of Indiana University.

SAFETY THROUGH THE YEAR. Florence Nelson and H. Louise Cottrell. New York: McGraw-Hill Book Co., Inc., 1937. 96 p. Ill.

Accident hazards are presented in a series of brief stories for children. Some questions are brought up for class discussion and others are placed with spaces left blank after them for answers. There are also charts to be drawn and various stories to be written in the children's own words. The attractive make-up and illustrations of this paper-bound book should make it interesting to school children and useful for safety training.

Books Received

ARTHUR SUNSHINE HOME AND NURSERY SCHOOL FOR THE BLIND: TWENTY-SEVENTH ANNUAL REPORT. Summit, N. J., 1937. 24 p. Ill.

BENNETT, WILMA: *Occupations and Vocational Guidance: A Source List of Pamphlet Material.* The H. W. Wilson Co., New York, N. Y., 1937. 124 p.

Current Publications on Sight Conservation

Note.—The National Society for the Prevention of Blindness presents the most recent additions to its stock of publications. Except for the more expensive ones, single copies are sent free upon request. Unless otherwise specified, they are reprinted from THE SIGHT-SAVING REVIEW. New publications will be announced quarterly.

237. Prevention of Occupational Eye Accidents, Claude S. Perry. 8 p. 5 cts. Discussion of the measures which will prevent eye accidents and their more serious complications.

238. What Are the Educational Facilities for the Visually Handicapped? Winifred Hathaway. 8 p. 5 cts. Presentation of bases of selection of children for sight-saving classes, together with a plan for how and where the classes should be taught.

239. The Problem of the Cross-Eyed Child, Le Grand H. Hardy, M.D. 8 p. 5 cts. The author outlines the five main steps in the treatment of the cross-eyed child, which requires patience, knowledge, tact and sympathy.

240. The Social Worker in Sight Conservation, Eleanor Brown Merrill. 8 p. 5 cts. In order to have greater concerted social action in safeguarding eyesight, the various threads of community activity which may in any way relate to questions of eye health should be drawn together.

241. Factory Lighting and Accident Prevention, E. W. Murray. 12 p. 10 cts. Specific examples of the need for good illumination in order to relieve the high and unnecessary expenditure of energy which always accompanies a badly designed or glaring installation.

242. What Does the Student of Institutions for the Education of Teachers Know About Eye Health? Anette M. Phelan, Ph.D. 12 p. 10 cts. In giving an exposition of the results of a test taken by 887 students in 12 teachers' colleges, the author explains the need for a more searching form of test.

243. Blindness Prevention, Harry Best, Ph.D. 8 p. Brief statement of national campaign to save sight, mentioning the work of the National Society for the Prevention of Blindness. Reprinted, with permission, from the *Social Work Yearbook*.

244. Don't Abuse Your Eyes, Angelo Patri. 4 p. A few "do's" and "don'ts" for parents who are concerned about their children's eyes. Reprinted with permission of the author and the Bell Syndicate.

D100. Conserving Eyesight, Forrest F. Slyfield, M.D. Reprinted from *National Safety News*, February, 1937. 2 p. A complete program of eye conservation includes protection against injury, correction of errors of refraction, and skilled medical service.

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